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THE BURDEN OF TELEPHONE TAXES—SERVICE CONNECTION CHARGE

Tucked away in a mass of statistics recently issued by the Interstate Commerce Commission is the statement that, during 1931 the 312 telephone companies reporting to the commission paid taxes aggregating $96,718,798. This was the last year's tax bill of the larger companies which operated approximately 17,500,000 telephones, or about 89 per cent of the total number in the United States.

The smaller companies—operating about 2,500,000 stations—undoubtedly paid additional taxes that made the grand total for all telephone companies close to $110,000,000. This means an average of about $5.50 annual taxes per telephone, which is a conservative estimate. The Indiana Bell reports its 1931 tax bill was $6.84 per station.

* * * *

Nothing further is needed to clearly demonstrate the alarming and outrageous increase of the tax burden on business. The year 1932 might easily see that gigantic load increased even more, were it not for the fact that business losses, due to the depression, have reduced revenue, so that federal income taxes, at least, may be lower even though Congress has raised the corporation rate. It is not the fault of the politicians that taxes are not mounting still higher.

All factors in the telephone industry can do themselves—and the country—no greater service than by fighting vigorously for drastic economy in government. Taxes have almost made business development prohibitive, and unless this over-taxation is effectively stopped, industry will be forced to close down and cease paying wages.

* * * *

The result of the Wisconsin primaries on September 20, however, encourages the belief that the public are at last awake to this peril—and it is a real peril. Defeat of the LaFollette school of political demagogues, whose motto was "Soak the rich," indicates that the people are tired of such dangerous leadership.

The spectacle of business corporations moving their factories out of Wisconsin to escape the tax blight, finally convinced the voters of that state that they must drive out of office the advocates of the ruinous taxation policy that was depriving thousands of workers of their jobs.

The crusade being carried on against public service companies in Wisconsin emanated from the same political school that has been defeated. Reduction of telephone rates 12½ per cent and interference with company management in various ways were merely the start of the warfare on the utilities. It is only reasonable to interpret the action of the voters to mean that they are not in sympathy with such attempts to harass these public services.

* * * *

The records show that of the $96,718,798 taxes paid by the 312 telephone companies in 1931, the federal government received $22,516,330, which means that about 78 per cent of the total went to state and local communities. Because of "tax strikes," and the refusal or inability of citizens to pay their taxes during the last three years, many cities would have gone bankrupt had not the utility corporations come to the rescue with advance payments to meet emergencies.

Chicago, particularly, has had to rely on taxes paid by the service companies to keep the municipal wheels turning. One suburban newspaper, the Calumet Record, very pertinently says in an editorial:

"A good many office holders have had a pleasant time damning the utilities of the country. By rights, they should really feel somewhat obliged to them, inasmuch as the utility industry, as a taxpayer, is one of the largest and most stable contributors to the cost of running the government.

Now, as in the past, the utility industry is one of the most progressive of industries. It has maintained its employment and wage standards at an extraordinarily high level during depression. Even so, there can be no question that the fear of more exorbitant taxation deters executives and stockholders from authorizing developments and expansions that would otherwise be made.

The utility companies and their customers should pay a fair share of government expense, but when taxes begin to approximate 50 per cent of profit, it is time we did some serious thinking."

Service Connection Charge.

It is noted that a good many complaints are being made lately against the service connection charge made by telephone companies, largely because the general public do not understand it. Letters printed in the daily press from persons questioning

rates, raise this point about the service connection charge and twist it—although unintentionally—into an argument that the company is using this charge simply to squeeze more dollars out of its subscribers.

Of course, the service connection charge is perfectly legitimate, is authorized by the regulatory commissions, and its purpose is to reduce the costs of the great body of service-users. It is based on the fair theory that the individual incurring the extra expense should pay, and not the other subscribers. The trouble is that people do not understand this generally, and telephone companies should take pains to explain it fully.

The proposition is handled effectively in the current bulletin issued by the California Independent Telephone Association whose member companies have had to contend with many awkward complaints about service connection charges. Secretary Ernest Irwin quotes a bitter letter written by a subscriber to a Sacramento newspaper, and also gives the reasons advanced by the state commission why such a charge is necessary and reasonable. The commission said:

"In order that rates may be kept as low as possible and that certain expenses created by particular users be paid by those users, the commission has required the telephone utilities to make, in general, two classes of charges; one the monthly charge for service and the other the instal'ation charge.

The installation charge is intended to cover the average cost of certain operations necessary in the installation of a new service. In this way, the charge for this expense, which a particular subscriber creates, is then paid for by that subscriber, and is not included in the total upon which the rates for service are based. Requiring new subscribers to pay a certain sum for the installation of service then allows the monthly rate for service to be reduced over the condition which would exist if no installation charge was made.

It may not be, however, that the installation charge of $3.50 for the installation of a new service where the telephone instrument is not in place, and the $1.50 charge for the establishment of service when the instrumentalities are in place, covers, in each case, the actual operating expenses resulting in the establishment of the service, but it is the average expense considering a large number of cases. In the total amount considered in determining the average, there is also considered the cost of disconnecting and removal of service.

This installation charge does not include the cost of the telephone nor any capital charge of any equipment or apparatus used in installing service, but only certain operating expenses involved, not only on the subscribers' premises, but also in the central office and business office."

* * * *

In commenting on the commission's statement, Secretary Irwin also made the following strong point which all companies should emphasize:

"The complainant, frequently, will advance as a protest against the reasonableness of the service connection charge, the argument that the gas, electric or water utility does not make a charge for the installation of its meter. In this connection it may be pointed out that the meter is not required in the proper rendering of any of these services, but is only incident thereto. It is installed by the company rendering that service for its use in determining the amount of the charges to be billed to the subscriber for services rendered.

Considerable initial investment in the way of appliances, such as stoves, toasters, irons, and other devices, is often required before the service delivered by these utilities is of use, whereas the telephone utility is required to own and maintain all facilities used in connection with the rendering of its service.

As stated above, the reasonableness of the service connection charge is based on the principle of requiring that the expense incurred directly by a particular subscriber be paid by that subscriber rather than by the general rate payers.

The charge thus paid reimburses the company for expenses actually incurred. It is not in any way to be confused with a deposit required by various- utilities (particularly gas and electric) for the purpose of establishing the credit of the applicant for service. The service connection charges does not remain as a credit to the subscriber's account and is not refundable."

COMING CONVENTIONS.

Canadian Independent Telephone Association, King Edward Hotel, Toronto, October 6 and 7.

United States Independent Telephone Association, Eastern Group, Hotel Deshler-Wallick, Columbus, Ohio, October 18, 19, and 20.

Independent Pioneer Telephone Association of the United States, Hotel Deshler-Wallick, Columbus, Ohio, October 19.

United States Independent Telephone Association, Western Group, Hotel Fort Des Moines, Des Moines, Iowa, October 25, 26, and 27.

Missouri Telephone Association, Hotel President, Kansas City, November 10 and 11.

Illinois Telephone Association, Hotel Pere Marquette, Peoria, November 16 and 17.

Transmission of Intelligence Over Wires

Development of Telegraph and Use of Intercity Telephone Lines for Carrier Current Telegraph—Recent Developments in Telephone Transmission—Paper Given at Annual Convention of Independent Telephone Association of Washington

By T. M. Libby,

Technician, The Pacific Telephone & Telegraph Co., Seattle, Wash.

At the time of Attila's invasion of Southern Europe, the principal means of communication was by messenger. When secrecy of communication was required, a slave's head was shaved and the message tattooed on the scalp. When the hair had grown sufficiently, this slave was dispatched to the destination of the message.

After the recipient had shaved the messenger's head and read the message tattooed thereon, the slave was placed in prison or put to death. While this method of transmitting intelligence was fairly reliable, it was extremely slow and costly, in addition to being at least uncomfortable for the messenger.

Shortly after the advent of electricity one of the proposed forms of the electric telegraph consisted of a line of five wires between inter-communicating points. Each wire was connected to earth through a key and battery at the sending end and at the receiving end, each wire connected to a finger of the receiving operator. By a prearranged code, shocks received in particular finger or combination of fingers, represented a definite idea.

The discovery of the laws of electromagnetism lead to the development of the direct-current telegraph in the form which we use today. This consists of a telegraph relay in series with a sending key and battery connected between the earth and the line at the two points between which intelligence is to be transmitted. These relays control the battery supply to local

sounders which produce audible clicks and clacks when the sending key is operated.

"By the use of a code of dots, dashes and spaces, to represent letters and numerals, intelligence can be transmitted at a rate of about 40 words per minute, under favorable conditions. By using a code of abbreviations for words the rate of transmission is increased to 50 words per minute. These speeds are obtained only by exceptionally skilled operators and can be maintained continuously for only about two hours. The upper limit of the transmission rate in this case is fixed by the speed and endurance of hand sending.

As the length of telegraph lines increased, the increasing fixed charges and maintenance cost necessitated an increase in the rate of transmission in order to keep the costs of this form of communication within useful limits. The developments of the duplex system whereby messages could be sent in both directions ceivers having a capacity of 60 words per minute. In appearance and operation these machines closely resemble the ordinary typewriter and coincidental with their

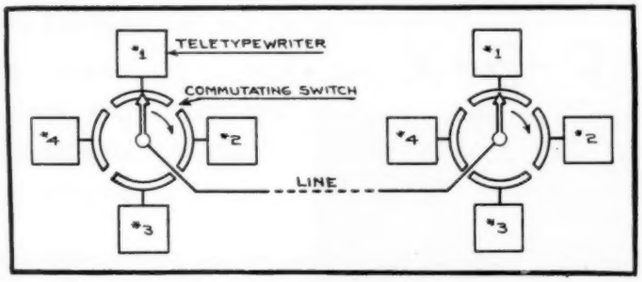


Fig. 1. Block Diagram of Multiplex Telegraph.

simultaneously over one wire, doubled the transmission rate and lowered the cost per word.

The duplex system was followed by the quadruplex, a system whereby four messages could be transmitted simultaneously, two in each direction. The application of the quadruplex is limited to high-grade lines, on which maintenance costs are high. Although engineers realized that the expensive long distance telegraph lines were capable of greater transmission rates, no improvements were made for many years following the introduction of the quadruplex.

In recent years the telegraph companies have developed mechanical senders and reuse, the skilled telegraph operator is replaced by a typist.

Here again, the maximum rate of transmission is limited not by the line but by the maximum speed obtainable in the complicated mechanism of the terminal equipment. Since the maximum transmission rate of the expensive line was not attained with the automatic senders and the speed of the senders could not be increased due to mechanical limitations, an ingenious system, named multiplex, was developed.

In the multiplex system, Fig. 1, a rotary switch or commutator is placed at each end of the line, the two switches being driven in synchronism. The blades of these switches are connected to the line and the points are connected to teletype machines. As the commutating switches make a complete revolution in synchronism, the transmission line is connected in sequence of different pairs of teletypewriters.

During the interval of time that the line is being used for transmitting a letter by one pair of teletypewriters, the others are going through the mechanical process of getting set to use the line in their turn. During each revolution of the commutator the line transmits one letter or character of each of four messages. Using four-point commutators and four pairs of teletypewriters, the rate of transmission is increased to 240 words per minute.

At the time of the advent of telephony it was possible to talk over only very short lines. Forty-seven years ago the Bell company spent $40,000 in a futile endeavor to telephone over a line only 20 miles long. However, as the efficiency of telephone apparatus increased, the lines steadily grew longer and longer and spread from city to city. These intercity telephone lines were to play an important part in telegraphy.

A filter was developed whereby each of the wires of a telephone circuit could be used as a telegraph line without interfering with the telephone service. This made available for lease to other companies and individuals a large number of telegraph lines which the telephone companies could not utilize. These telegraph facilities were leased by news agencies, brokerage firms, wholesale distributors, etc., and operated by them as private telegraph lines.

The increasing demand for private lines ultimately exceeded the supply made available by the simple compositing method. This demand resulted in the development of the carrier current telegraph system.

Briefly, in this system ten different frequencies from ten separate generators are impressed upon the telephone circuit at each end of the line. Also, ten receiving sets are coupled to each end of the line, each receiver being tuned to respond to but one generator at the opposite end of the line in the same manner that ten radio receivers may be tuned to ten different radio transmitters. A telegraph key is placed in each generator and a relay operating a sounder is connected to the output of each receiver.

The carrier current frequencies are between 3,300 and 10,000 cycles per second, while the voice frequencies of the telephones are between 200 and 3,000 cycles. Filters are provided which prevent interference between the telephone and the carrier systems.

The carrier current telegraph system cannot be used on lines transmitting radio programs, since program circuits must transmit the higher audible frequencies which lie in that part of the spectrum occupied by the lower carrier frequencies.

This system was developed for use on open-wire leads only, except for short lengths of entrance cable. As long cable circuits replaced open wires and it was not economical to build cable plant which would transmit the higher carrier frequencies, a new low-frequency telegraph system was developed whereby 12 telegraph channels could be established over any telephone channel.

This system, which is called the voice frequency telegraph, consists essentially of an induction type generator producing cur-

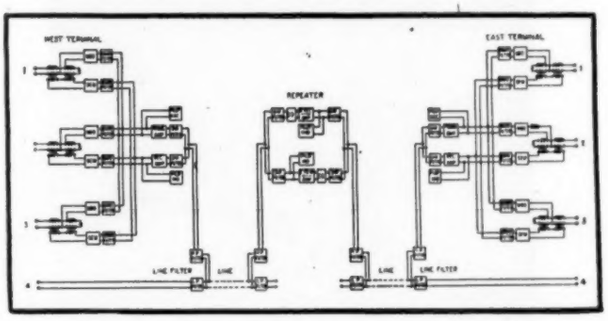


Fig. 2. A Complete Carrier System Schematic.

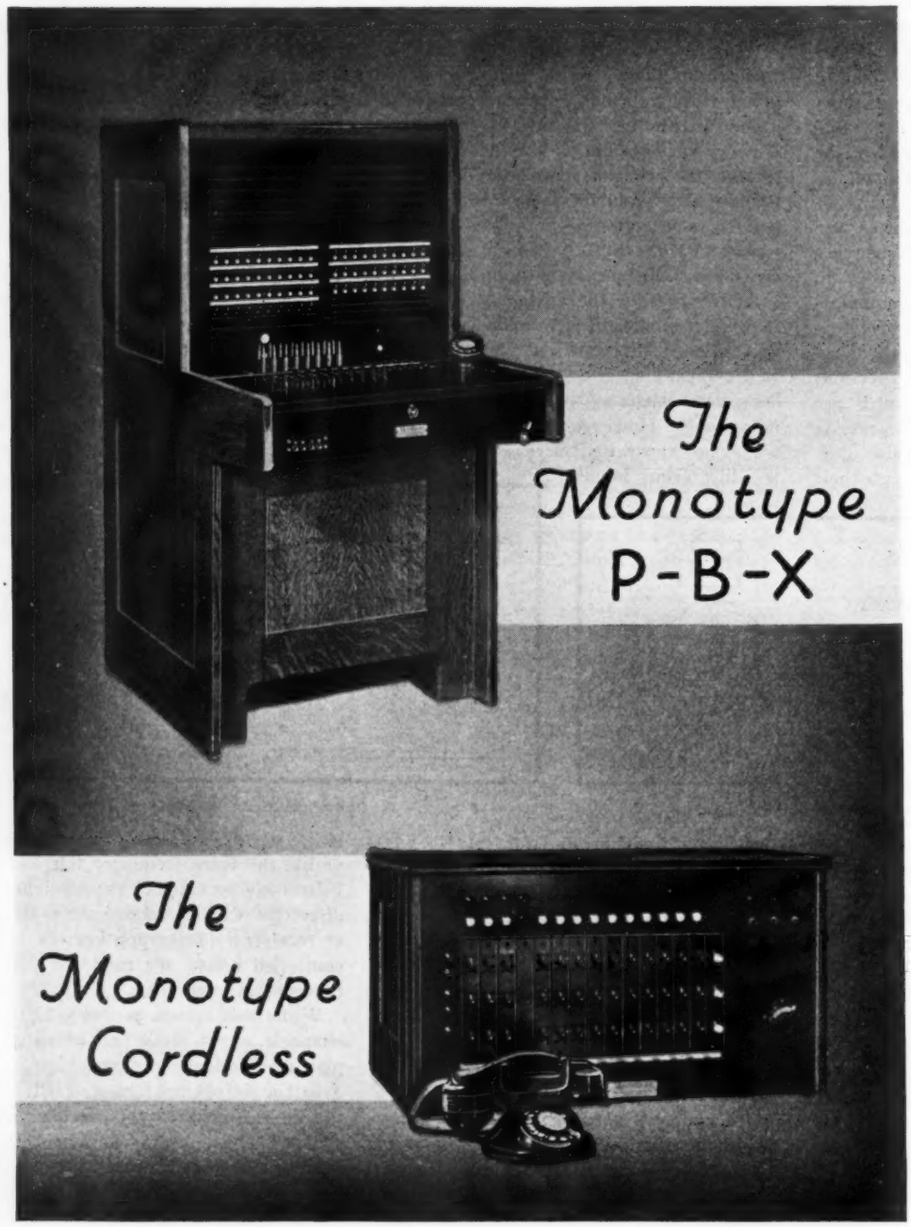
rents of 12 different frequencies lying within the voice frequency telephone band. Filters are provided at the receiving end to direct the various frequencies to their proper receivers. Telegraph keys or remotely-controlled relays are used for controlling the generator currents.

While this system provides 12 telegraph channels over a single pair of wires, it displaces one telephone channel.

In the foregoing I have briefly outlined the development of the electric telegraph systems which occupy an important place in the field of wire communication and are definitely tied in with our telephone transmission facilities. While the electric telegraph preceded the telephone, the development of these two means of communication have taken place side by side. To you of the telephone industry, telegraphy is of secondary importance and interest in the communication field, but it is, nevertheless, an important by-product which cannot be neglected in the economics of communication.

I shall not attempt to outline the history of telephone development, but I wish to present briefly some of the important developments in telephone transmission in recent years.

The advent of the vacuum tube repeater removed all physical limits to the lengths



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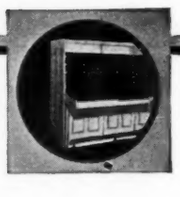

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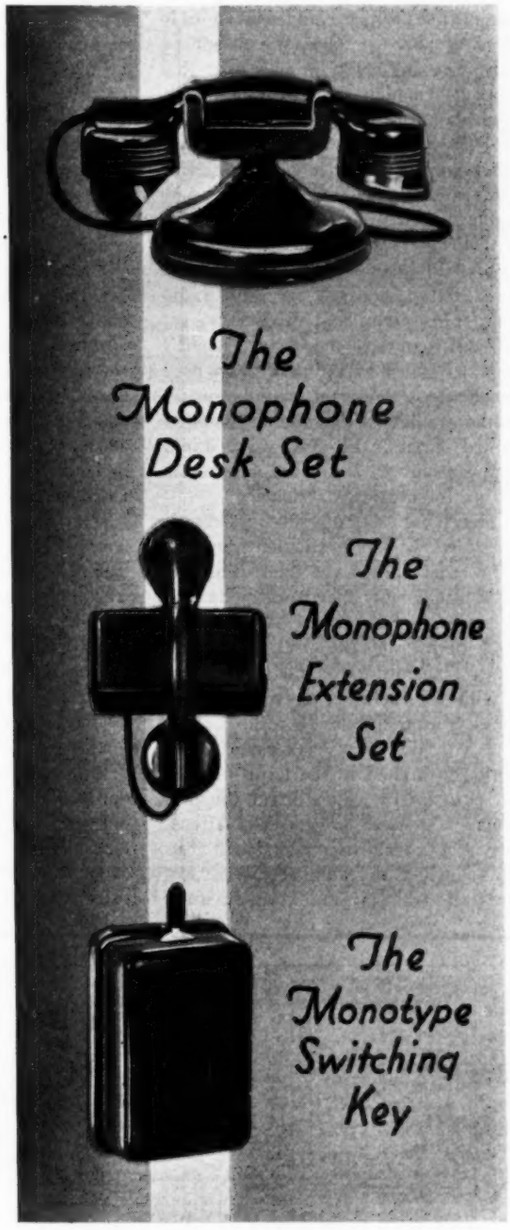

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of the lines over which voice currents can be satisfactorily transmitted. The importance of the modern repeater in overcoming the losses of long lines will be illustrated later. While the repeater removed the physical limits, it did not entirely remove the economic barriers to long distance telephony.

The enormous costs of building and maintaining lines which could provide only two physical and one phantom circuit on four wires, would result in toll rates that would not be conducive to widely-used universal telephone service. The necessity for greater efficiency in the use of the costly long lines was the mother of the carrier current telephone systems.

Referring to Fig. 2, we see that the carrier telephone system is similar to three two-way radio telephone links in that at each end of the line there are three radio telephone transmitters and three radio receivers.[1] Of course, the wave lengths used here are much longer than those used for broadcasting, but you may be interested to know that on the Pacific Coast of the United States, the long-wave radio telegraph stations in Japan are frequently received on these carrier systems.

Each receiving set of this system is tuned to respond to its particular transmitter at the other end of the line. The line acts as a guide for the voice-modulated carrier waves, thereby conserving the energy and permitting the use of a large number of transmitters on the same wave length without interference, which is an impossibility in the case of radio broadcasting as you, no doubt, have experienced.

Attention is invited to the large number of band pass filters which direct the different waves to their proper destinations. Evidently the much-discussed band pass filter was applied to radio receiving sets prior to the advent of rado broadcasting.

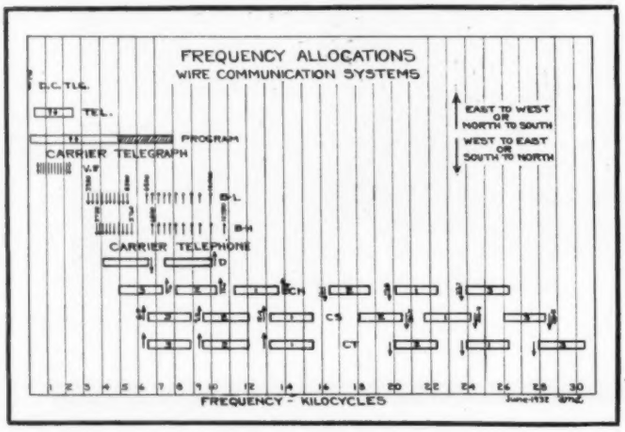


Fig. 3. Frequency Allocations.

Since the frequencies employed in the carrier systems are greater than those used for voice-frequency telephony, the carrier system may be superimposed upon the voice-frequency and direct-current telegraph. By this means, four telephone and two telegraph circuits are obtained on a single pair of wires, an increase of 400 per cent in usage gained by the addition of the carrier terminal equipment, the cost of which is slight compared to that of lines.

By examining the frequency allocation chart of Fig. 3, we see the possible combinations of systems that can be superimposed on a single pair of wires to obtain a large number of communication circuits per pair. Two systems occupying the same frequencies cannot be superimposed. Also, remember that not every type or kind of line is suitable for all systems. As examples, carrier telephone lines require special transpositions and insulators; entrance cable and its loading must be suitable; pin positions on the lead may be a determining factor; prime facilities for carrier telegraph may not be suitable for carrier telephone systems.

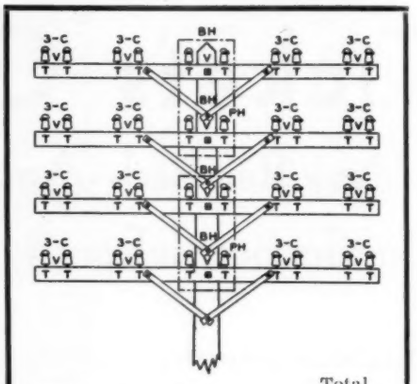
On the other hand, the voice-frequency telegraph system may be worked over any telephone channel. As an instance, by superimposing the voice frequency telegraph on the type "C" carrier telephone and the voice-frequency band, we obtain 48 telegraph channels in addition to the two direct current telegraph channels working to ground, or a total of 50 telegraph channels on a single pair of open wires. Each of these telegraph channels may be a teletypewriter circuit handling 60 words per minute; 50 times 60 or 3,000 words per minute being transmitted across the country on a single pair of wires. This is an enormous improvement over the practices of two years ago.

We have gone a long way in utilizing to the utmost the transmission possibilities of a single pair of wires, but still we are not satisfied, for not all of the pairs in the old standard lead are suitable for carrier transmission. We find, for instance, that on a 12-inch spaced 40-wire lead we can place type "C" carrier telephone on only the non-pole pairs of the first and third arms, and neither type "D" nor type "C" carrier can be placed on the pole pairs.

Rearranging the pin positions on eight-inch spacing, as shown in Fig. 4, we can place "C" carrier on all but the pole pairs.[2] This results in 70 telephone and 80 telegraph circuits, on the new 40-wire lead.

The great demand for toll facilities between the larger cities has compelled the replacement of open-wire leads with cable. In some instances, as many as 25 open-wire leads would be required to handle the traffic now carried by cable between two of the Eastern cities.

This replacement of open-wire toll leads with cable has greatly reduced the problems of inductive interference and crosstalk and has lowered maintenance costs and increased reliability of service. On the other hand, many new problems in cable transmission have required solution.



Symbol.	Facility.	Total Circuits.
V	Voice frequency, physical	20
PH	Voice frequency, phantom	2
3-C	Carrier telephone.....	48
T	D. C. telegraph.....	40
BH	Carrier telegraph (10 channels)	40
	Total, telegraph.....	80
	Total, telephone.....	70

Fig. 4. Pole Line Configuration, Non-Phantomed Construction, Eight-Inch Spacing Between Wires of Non-Pole Pairs.

I wish to invite your attention to the nature of these problems.

Fig. 5 shows the attenuation frequency characteristics of a 50-mile section of No. 16 gauge cable.[3] The lower curve is for the non-loaded condition and refers to the right-hand attenuation scale. Note that in the non-loaded condition the attenuation at 100 cycles is 12 decibels, at 1,000 cycles it is 36 db, and at 5,000 cycles the attenuation is 64db. This means that the power loss in the transmission of 1,000 cycles is 250 times greater, and at 5,000 cycles it is 157,000 times greater, than the transmission losses at 100 cycles. This results in bad distortion manifested by a preponderance of the base frequencies.

The intermediate curve of Fig. 5 shows the effects of placing B-22 loading on this cable pair. Note that with the exception of the lowest frequencies the attenuation or line losses have been materially reduced, and the losses over the frequency band used for toll message service (100 to 3,000 cycles) are substantially constant. How-

[1] "Carrier Systems on Long Distance Telephone Lines," by H. A. Affel, E. S. Demarest and C. W. Green, Bell System Technical Journal Vol. VII, No. 3; illustration by permission.

[2] "Telephone Systems of the United States," by Bancroft Gherardi and F. B. Jewett, Bell System Technical Journal Vol. IX, No. 1; illustration by permission.

[3] "Long Distance Cable Circuit for Program Transmission," by A. B. Clark and C. W. Green, Bell System Technical Journal Vol. IX, No. 3; illustrations by permission.

ever, this loaded pair is not satisfactory for the transmission of high-quality radio programs covering the band of frequencies between 40 and 8,000 cycles per second. We see that the loss at 8,000 cycles is 126 times the loss at 40 cycles.

To make this loaded circuit suitable for program supply purposes, an equalizing network is added to the line. This equalizer introduces losses which are complementary to those of the cable pair so that the result is a higher but constant loss at all frequencies within the transmission band.

The total losses of the loaded cable pair and the equalizer are shown by the top curve of Fig. 5. From it we note that the resulting transmission loss is 24 db. This means that 99.6 per cent of the sending power will be dissipated in transmission over this 50-mile circuit.

In order to appreciate the full significance of the losses in cable circuits, let us consider a 200-mile length of the loaded and equalized No. 16 gauge cable. In order to receive satisfactory power levels or volume over this length of cable, it would be necessary to send into the far end a power of 50,000 kilowatts or, say, 316 amperes at 150,000 volts. If, however, we place four repeaters along the line at intervals of 50 miles, we can talk over this line very well indeed, using our standard telephone sets. These four repeaters would consume a total power of one kilowatt. This comparison forcefully illustrates the value of repeaters.

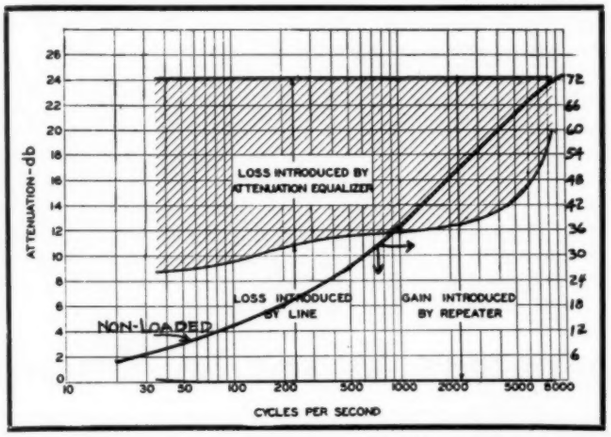
The question may be asked: "Why not use a single repeater at the receiving end?" Fig. 6 depicts the transmission levels along the cable under three different conditions. Curve *A* shows the levels that would be required if the cable were not repeatered. Here we see that in order to obtain sufficient energy at the receiving end, a sending power of 50,000 kilowatts would be required for it.

Curve *C* shows the transmission levels that would exist if a single repeater were used at the receiving end. Note that the level of transmission falls far below the noise level and that upon amplification by the single repeater, the noise would be many times greater than the voice currents, thereby precluding all possibility of communication.

Curve *B* shows the transmission levels along the line using repeaters every 50 miles. Under this condition only ordinary power levels are encountered and the voice levels are not permitted to fall below the noise level.

If the cable temperatures remained constant, the application of loading, equalizers and repeaters would be sufficient from the standpoint of transmitting the required power free of noise. However, the cable temperatures do vary from hour to hour, day to day, and season to season, with a corresponding variation in the transmission losses of the cable. The magnitude of the variation in cable attenuation for a 54-degree (Fahrenheit) temperature change on a 2,000-mile cable, for 1,000 cycles, is 56 db or a power loss variation of 400,000 times.

If a long cable shaded by clouds is satisfactorily transmitting a telephone conversation and the clouds break up, the consequent rise in cable temperature will result in a complete fade-out of the conversa-



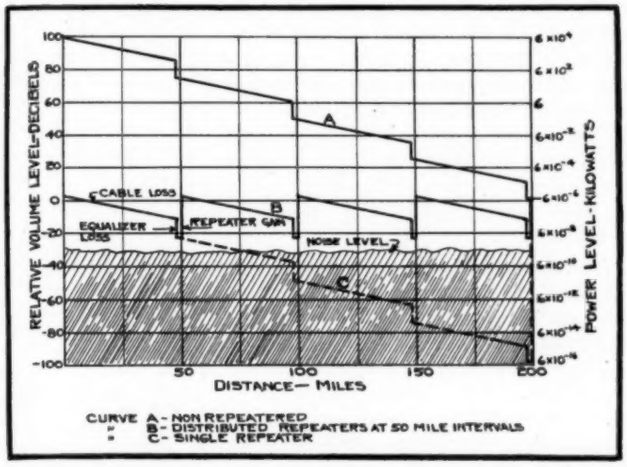
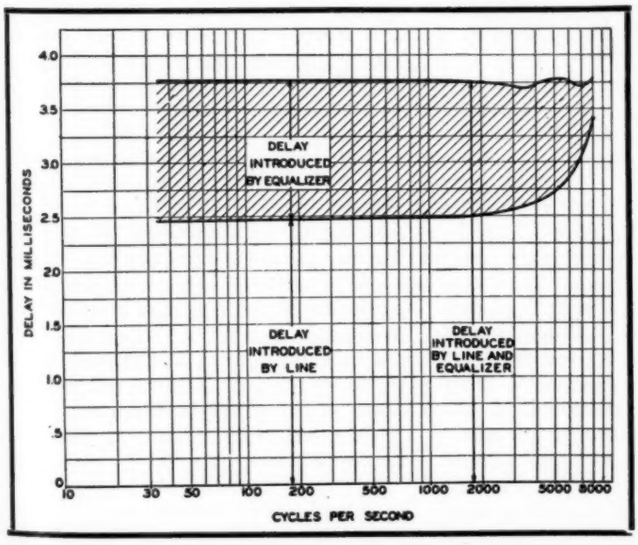


Fig. 5. Attenuation Frequency Characteristics of Line Equalizer and 50 Miles of No. 16 Gage B22 Cable and 50 Miles No. 16 Gage Non-Loaded Cable. Fig. 6. Transmission Level Diagram, Cable Circuit.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DELAY INTRODUCED BY LINE AND EQUALIZER
CYCLES PER SECOND

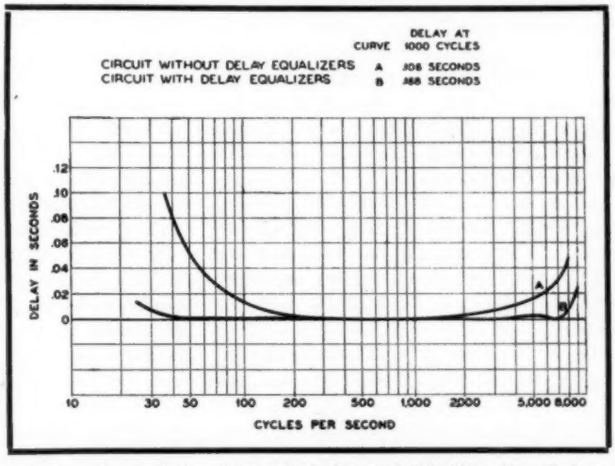

CURVE
DELAY AT 1000 CYCLES
CIRCUIT WITHOUT DELAY EQUALIZERS A .108 SECONDS
CIRCUIT WITH DELAY EQUALIZERS B .188 SECONDS
DELAY IN SECONDS
CYCLES PER SECOND

Fig. 7. Delay Frequency Characteristic with and Without Delay Equalizer. Fig. 8. Delay Characteristics of 2,200 Miles No. 16 Gage B22 Cable Program Transmission Circuit.

tion. It is, therefore, necessary, on cable runs of 300 miles in length, to provide automatic volume regulators. These volume regulators are controlled by a pilot wire in the cable and closely compensate for the attenuation variations due to temperature changes.

One would think that the measures described in the foregoing would surely provide satisfactory transmission; and so they do from the standpoint of delivering the required amount of power at all frequencies. We must now consider the form in which the power is received. The quantity may be ample but the quality may be entirely unsatisfactory.

An examination of Fig. 7 discloses that not all of the frequencies travel along the cable at the same speed.[3] We note that the higher frequencies are delayed in transmission to a greater extent than the lower frequencies. This unequal delay on a short section of cable is of no consequence, but on a long cable the resulting distortion may make the speech unintelligible and music extremely unnatural.

On long circuits the loading and filters are chiefly responsible for the high-frequency delay, and the repeaters cause the low-frequency delay. The effects of these delays may be described as follows:

If at the sending end of the circuit three piano notes are struck simultaneously, one note being in the center of the scale and the other two notes being at the opposite ends of the scale, the high and low notes would travel slower than the middle note and arrive at the receiving station after the arrival of the middle note.

In the transmission of speech or music under this condition the distortion is manifested by a hollow booming of the low frequencies and chirps or "birdies" in the high frequencies. Happily, this form of distortion can be corrected by delay equalizer networks, with the result shown by the top curve of Fig. 7. Fig. 8 shows the comparative delay characteristic of 2,200 miles of the cable discussed, with and without delay equalizers.[3]

In connection with transmission delay, attention is invited to the relative low velocity of transmission on facilities of the type under discussion. In this particular case, the velocity is about 13,000 miles per second.

If an impedance irregularity exists at the remote end of a 500-mile circuit, a part of the energy arriving at that end will be reflected back to the transmitting end, arriving to the speaker in about one-tenth of a second after spoken. This echo may be very annoying to the users and necessitates the application of echo suppressors on some types of facilities exceeding 300 miles in length.

As a matter of interest, if a cable circuit of 10,000 miles in length were set up, the time required for the voice currents to travel from one end to the other would be one-half second, and the interval between speaking and receiving a reply would be one second. When that time comes, we must search for some method of increasing the velocity of transmission.

Independent Pioneers to Hold Meeting in Columbus, Ohio.

The officers of the Independent Pioneer Telephone Association of the United States have decided to omit the customary social session this year. Since its organization about ten years ago the Pioneers' luncheon and entertainment has been the great social feature of the annual convention of the Independent industry.

In view of general conditions and also because the United States Independent Telephone Association will not hold its usual annual convention this fall, the Pioneers gave up the luncheon and entertainment. Instead of this affair a business meeting will be held in Columbus, Ohio, during the group meeting of the national organization.

According to an announcement by President Frank L. McKinney and Secretary-Treasurer J. K. Johnston, this session will be "short and sweet," for the election of the necessary officers and directors and the transaction of other business. It will be held at 4:00 p. m. on Wednesday, October 19, at the Hotel Deshler-Wallick, Columbus, Ohio. Pioneers are urged to attend this business meeting. It is not likely that a Pioneers' meeting will be held at Des Moines. Next year it is expected that the annual entertainment and meeting will be held in Chicago and will be more enjoyable than ever because of the omission of this year's social gathering.

What Operators Want to Know

Companies Have Felt the Pressure of Economic Conditions; Earnest Sales Efforts Have Offset New Loss of Stations—Employes Become Familiar With Companies' Policies—No. 66

By Mrs. Mayme Workman,
Traffic Supervisor, Illinois Telephone Association, Springfield, Ill.

During the past few years we have been called upon to answer many questions. This is particularly true of those chief operators who also do commercial work and come in face-to-face contacts with their customers. Among the questions asked are those similar to the question asked in No. 5: "Are times getting hard with the telephone company?" It helps our relations with our customers if we are able to give them intelligent answers to their questions.

While telephone companies did not feel the pressure of economic conditions as soon as most other industries, for the past two years telephone companies have been losing stations and there has been a decrease in the amount of toll business.

Almost without exception, every exchange I have visited in the past year and a half has reported a loss of stations and a decrease in the number of toll calls filed. The net loss of stations has been offset to a great extent by the fine work that has been done by telephone employes in all departments in the companies' sales campaigns. The traffic department has made a fine showing in selling telephone service.

We have been called upon to work harder perhaps, during these distressing times, but we have derived many benefits therefrom. I believe all telephone employes today have a better understanding of the business in which they are engaged and of the companies' policies.

Recently I had occasion to spend several hours with an employe of one of the larger telephone companies. While we were riding through the country, she suddenly pulled out a slip of paper and said: "I am going back to work tomorrow after having a two-weeks' vacation. I wish you would see how well I know the prices of the different kinds of service. I have to sell one more telephone before I will have my quota for this year."

This operator could tell me the rate for all the different classes of service and for additional service. I am sure she could not have done so before she became interested in selling telephone service.

It is well to remember that to the prospective customer, customer, acquaintance and friend the fact that we are employed by the telephone company gives them reason to believe that we know everything there is to know about the telephone business and that we should be able to answer any and all questions put to us.

So let us make an effort to keep informed, not only about the functions of our own particular department, but all departments of the telephone company. If we do this, we shall be able to answer all questions intelligently, and this will merit the confidence of the public and will improve our relations with them.

Questions from Illinois Operators.

1. Do you hold the circuit if you receive a report that the called party has a "non-published" telephone?
2. Should you enter the recorder's number and the operator's number also?
3. Are calls counted "CLR" if a report is given in three minutes?
4. When should the rate on a ticket be encircled?
5. What must we say when a subscriber asks, "Are the times getting hard with the telephone company?"

For answers to these questions from real Illinois operators, please turn to page 26.

"Selling Your Product by Telephone"

An Address Before the Rochester (N. Y.) Sales Managers' Club Emphasizing the Use of the Telephone as a Particularly Desirable Aid to Selling Goods—Many Ways in Which Telephone Can Be Used Effectively—Keytown Selling

By Frank T. Byrne,
Commercial Superintendent, Rochester Telephone Corp., Rochester, N. Y.

To the minds of telephone people there are four factors in the scheme of modern business that make the use of the telephone particularly desirable as an aid to selling. These are: The general emphasis on lower distribution costs; the tendency for these costs to increase; the effects of modern advertising; and present-day competition.

A brief review of the problems and conditions that are confronting us, which can be grouped under these headings I just mentioned, will I am sure enable us to see just how the telephone can be used to assist in the solution of these problems.

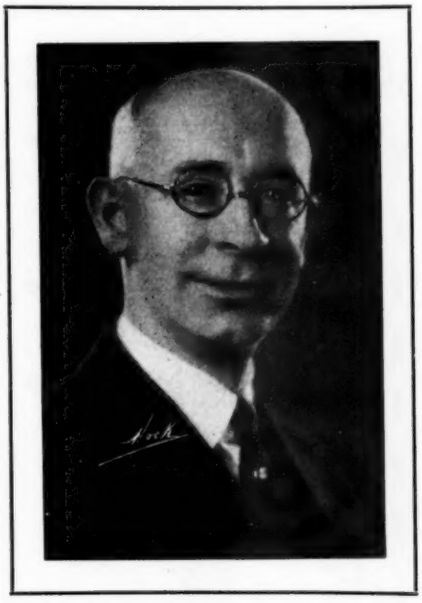
The costs of that part of the distributive process, consisting of the physical operations which enter into the moving of goods from producer to consumer, are largely beyond the control of the individual business concern, being determined as they are by existing freight rates, warehousing charges, packing costs and similar items; but the costs of advertising, salesmanship, dealer helps and other promotional plans for increasing or maintaining sales volume are to a large degree controllable.

When we realize that the savings which have been accomplished by improvements in the production methods of our businesses, have been largely wiped out by the increase in the cost of selling goods, we can understand why so much criticism has been directed toward sales promotion activities during the last few years.

In the February 7, 1931, issue of Sales Management, Carl M. Bigelow, president of Bigelow, Kent & Willard Co., Inc., of Boston, included in an article which he wrote under the title, "Is There a Cure for Uneconomic Prices and Abnormal Selling Costs?" a chart showing the proportion of the consumer's dollar allocated to production and distribution, at two different periods of a decade. In 1920 approximately 60 per cent of the consumer's dollar went into production and 40 per cent into distribution; in 1930 conditions were reversed, approximately 40 per cent going into production and 60 per cent into distribution, Fig. 1.

Now going back to the controllable factors, the cost of personal salesmanship is a sizable item in the sales promotional expense of nearly every concern. Certainly anything that can be done to reduce this item or to spread it over a greater volume of business, will produce a lower cost per unit of sale; and this cost per unit of sale is something about which we have been hearing a great deal in recent times.

The telephone can be used advantageously for this purpose as a *supplement* to the personal visit, thereby giving more frequent coverage; or as a substitute for some of the personal visits, thereby permitting the same frequency of coverage but with a lower selling expense. That the telephone can play this most important part



"That the Telephone Can Play a Most Important Part in the Program for the Reduction of Sales," Says Mr. Byrne, "Has Been Proved Beyond the Question of a Doubt by Many Business Concerns, Both Local and National in Character."

in the program for the reduction of sales costs, has been proved beyond the question of a doubt by many business concerns, both local and national in character.

In spite of the efforts that have been made and the emphasis that has been placed on lowering the cost of sales, the tendency is for these costs to rise. Competition, of course, is a sizable influence in this direction, but I want to speak more particularly of two other conditions —hand-to-mouth buying and the increase in the number of jobbers.

Hand-to-mouth buying has reduced the size of the average order in many lines to the point where sales managers, in an effort to market their goods profitably, have resorted to what was described by Raymond Weniger, sales manager of the American Multigraph Co., in a talk which he gave some time ago before our club, as selective selling. Mr. Weniger explained selective selling to mean the elimination in some instances of whole territories, in others certain towns, and in others certain accounts, from any sales effort at all.

In a period of seven years, according to a survey compiled by the Dartnell Corp., the number of electrical supply jobbers increased 80 per cent, the number of sporting goods jobbers 128 per cent, the number of drug jobbers 140 per cent, and the number of hardware jobbers 199 per cent, with similar increases in other lines. This increase in the number of jobbers has multiplied the number of contacts necessary, and consequently has increased the costs of selling trades in which the number of jobbers has grown.

The telephone has been used with more than ordinary success to combat this influence of hand-to-mouth buying and this increase in the number of jobbers. A considerable number of sales managers, after they realized that some territories, some towns, some accounts could not be profitably sold through personal visits, adopted the telephone sales plan; and not only were they enabled to keep their territories intact, but in some instances they were able to extend the scope of their operations profitably.

Modern advertising has made the names, the quality, the appearance and the uses of thousands of products familiar to millions of people. Hand in hand with this stupendous increase in advertising, there has been a widespread increase in packaging, branding and trade marking, so that appearance, qualities and values are more and more becoming associated with brand or trade-mark names and with the names of manufacturers.

This is a most important advantage from the standpoint of telephone selling, because standardized products do not require inspection, the qualities are known; the packages, the brands and trade marks are recognized immediately; consequently the necessity for a personal visit by a salesman is minimized.

Competition is not solely a matter of price and quality any longer; the growth of large industries has equalized the cost of goods of any given quality. Today one of the major factors of competition is service; service from the standpoint of the speed of delivery, prompt and willing adjustments, quick repairs and a prompt availability of repair parts.

In this sense then, service is dependent upon rapid communication. Speed of delivery, for example, is contingent upon

the speed with which orders are transmitted; speed in making repairs depends upon the fast means of notifying the seller of the need for parts. The telephone is certainly well adapted to the furnishing of better service in selling.

There are many ways in which the telephone can be used effectively in the

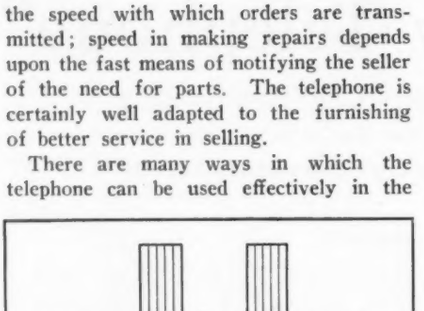


Fig. 1. The Consumer's Dollar Allocated to Production and Distribution at Two Different Periods of a Decade.

actual selling of goods, but no plan for its use in this particular connection should be adopted until it has been thoroughly studied and the details of the plan definitely worked out. Your product should be studied to determine how you will present it by telephone; your market should be carefully analyzed to determine on what basis telephone calls will be made. Your sales organization should be thoroughly instructed before allowing it to use any telephone plan.

I want to digress just a moment to show you charts of just two of the eight or ten plans that are being successfully used.

Fig. 2, shows a typical keytown arrangement. The keytowns are centrally-located points which are as nearly as possible surrounded by a considerable number of customers and from which telephone calls can be made to a number of smaller less accessible points quickly and inexpensively.

Let us suppose, for a moment, that you have decided to use keytown selling. The salesman goes to the first keytown and secures orders in person from his customers there. He next telephones customers in the surrounding territory. Having secured their orders, he moves on to another keytown and repeats the process, continuing until his route is covered.

An idea of the skip-stop method of selling is given by Fig. 3. It is a modification of keytown selling. The chart illustrates clearly just how this plan works out. Towns 1, 2, 3 and 4 are visited in person the first time out. After calling on customers in Town 1, the salesman telephones from there to dealers in Town A; from Town 2 to the dealers in Town B, and so on. On the return trip, he calls on the dealers in Town A and telephones to the dealers in Town 1, and so on until his route is covered.

Let me give you some instances of the successes obtained in the use of these plans:

A manufacturer of a high-priced radio with national distribution, used the telephone to introduce a new model quickly to his dealers throughout the Atlantic seaboard and Middle West. Every dealer in this area was first circularized by direct mail. Twelve telephone salesmen started from different points. Then they began to call each dealer in the district surrounding a selected keytown. These men proceeded from town to town, using the Keytown selling plan, until every dealer had been covered either by personal visit or by telephone.

A careful record was kept of the telephone results by each man. During a

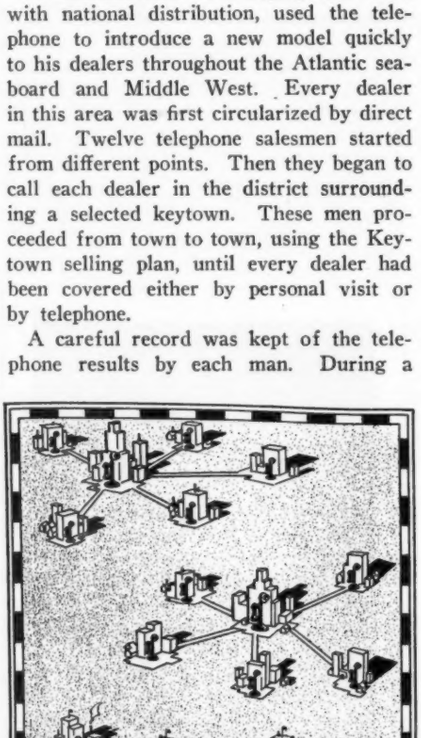


Fig. 2. Typical Arrangement of Keytown Selling by Telephone.

period of a week, 12 salesmen made 702 telephone calls and were able to sell 600 units to 358 accounts. The revenue from these amounted to more than $38,000. This $38,000 worth of business which resulted from sales actually made over the telephone cost in telephone charges $488.78, or 1 3/10 per cent of the value of the product sold. To have covered this same territory by personal visits would have required at least three weeks longer, with a much greater resulting expense.

A selling agency, with the exclusive sales right to the products of 35 manufacturers of hardware and electrical appliances which it distributes throughout the United States and Canada, adopted the following plan:

Ten salesmen operating out of a corresponding number of large cities arranged their work in such a manner as to allow them to make four or five personal calls and eight out-of-town telephone calls each day. Three of these eight telephone calls were made to customers whom it would be expensive to see personally because they were off the beaten track. In view of this fact it was decided to take orders over the telephone. An average of two orders were secured out of each three calls.

The remaining five calls were made to arrange for appointments with customers in the next town enroute. In every case when the called party was reached, an appointment at a future date was the result. The normal 21 days required by a man to cover his territory was cut by this plan to about 15—an actual saving by the combined group of 60 working days in one coverage of the territory.

A lumber company uses the telephone plan for executive contact in conjunction with the keytown plan of telephone selling. The sales manager keeps in constant touch with the salesmen in the field by telephone so that their selling ability may be used to the greatest possible advantage. The salesmen scattered over the Atlantic seaboard telephone to headquarters in New York every other day to learn of new leads, secure instructions as to price changes, to receive advice and suggestions from the sales manager, and in their turn to report any unusual trade conditions. The telephone in this case is generally used in the following manner:

The sales manager, let us suppose, has received an inquiry through the mail from Portland, Me., regarding a certain quantity of lumber. He knows that one of his salesmen covering that territory will call at 10:30 o'clock.

When the salesman calls, the sales manager refers the inquiry and tells him that all of the material can be furnished from

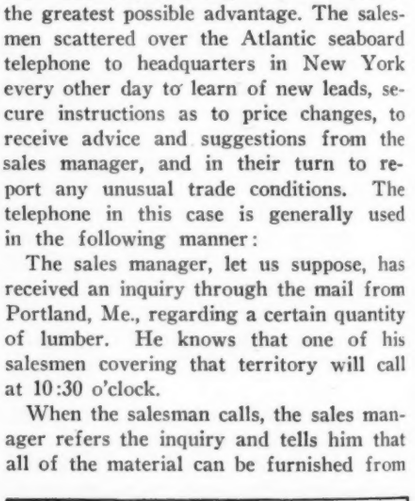


Fig. 3. Skip-Stop Method of Selling, a Modification of Keytown Selling.

stock, with the exception of certain hardwoods; but they can, however, divert a car at Albany and deliver the hardwoods as well. He suggests that the salesman notify the prospect by telephone when the delivery can be made and arrange to see him immediately. The prospect, of course,

is usually surprised at such service and generally places the order.

A wholesale milk company with 11 branch offices east of the Rocky Mountains, employing a sales force of 150 men, decided to conduct a trial test of keytown selling, extending over a period of one week.

Three salesmen then went to the customers' room provided by the telephone company in a selected keytown, and between them they made 254 calls to jobbers and storekeepers in the surrounding districts. Of these 254 calls, they obtained 239 interviews and made 106 actual sales.

The revenue value of these sales amounted to $493.50 and the cost in telephone charges was $26.60, or about 5 per cent of the value of the product. Beside the money value of these sales, this company at the same time was developing new accounts as well as bettering its relations with those concerns who were already on their books.

Needless to say that after this test the plan was adopted throughout the entire sales force. Travel time for a typical territory has been reduced from six weeks to approximately 10 days.

The value of a sustained telephone sales program is illustrated by an example taken from the textile field, where the goods sold are usually staple and the firms large and well known to one another.

One progressive company handling a large amount of cotton-print goods uses a system of forwarding samples, followed by a telephone call. This telephone plan has not only substantially increased the sales volume of this firm to approximately $1,500,000 a year, but has enabled it to maintain the best of personal relations with its customers.

Telephone Company Has Communications Exhibit at Fairs.

The exhibit of the Lincoln Telephone & Telegraph Co. at the Nebraska state fair attracted wide attention from visitors. The exhibit was in charge of B. C. Burden, transmission engineer, and writer of technical articles for TELEPHONY. It consisted in part of some of the latest developments of the art of electrical communication.

Included in it was an "electrical brain" or mechanical robot, as it is most generally known. The apparatus made use of the ordinary telephone mechanical switch used in all automatic exchanges. By means of an ingenious circuit arrangement involving vacuum tubes and the ordinary telephone instrument, it was possible to secure answers to questions asked it and to secure obedience to commands to perform certain acts.

When told to ring the bell it did so, told the time, played music and lit lights. This was the first time the steel mechanical man had been seen by thousands, and he was kept busy much of the time. Operation of the automatic telephone exchanges was shown by means of a complete working demonstration which made visible everything that happened when a call was made.

Another interesting feature was a ladder of fire which demonstrated, by the use of high voltage currents, how an electrical arc performs when confined to a glass tube.

An audible light demonstration was also staged. This showed how speech and music can be transmitted over a light beam, and also how light sounds. The scraping of an ordinary match was made to resemble thunder in its passage through the equipment.

The noise from light thrown off by an ordinary house lamp was also made audible. Mr. Burden says that this principle of using a light beam was recently exemplified when communication between a ground station and the dirigible Los Angeles was effected, without use of wires or radio, the slender beam of light transmitted by the ship being picked up by a photo-electric eye located a mile and a half away at a ground station.

OCTOBER

By Miss Anne Barnes,
Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

The month of October represents the fulfillment of all that which other months have grown toward. Truly, it requires all the other months to make our rich, golden Autumn month.

We sometimes feel sad when we see the leaves begin to fall, because they suggest the finish of something—and decay. But if we attune our mood to their soft, hesitant flutter as they drift downward to the earth, we may hear a triumphant note in their quiet symphony, of tasks accomplished, as Mother Earth gathers them into her bosom. Decay? No, no, they are singing, "Life, life, life."

So when we feel a bit sad at the thought of October, with her rich store of golden glory, bidding us farewell, let us not think she is leaving us with tears in her eyes. October will go out gleeful-looking, just like her mischievous little pumpkin faces. I like to think of her that way.

There are so many beautiful memories stored up in the month of October. We do not sense the absence of the birds because we seem to hear the echo of their songs, which, of course, is a trick memory plays on us.

The blackbirds scudding southward across the heavens are a picturesque sight indeed. There is rhythm in their motion, perfect organization in their flight.

Although the woods are being quietly, surely, and almost imperceptibly shorn of their glorious coronation day clothing, our eyes linger on the rich changeable beauty all about us. What a golden day of memories we store away after a day in the woods!

And say, did you ever spend a day in the woods gathering nuts? Well, I have, and I hope you have or will some time. Don't allow another October to go without spending a few hours in the woods searching for nuts. That is one of the happiest memories of my childhood. We used to spend a whole day in the woods, returning home at night, under the light of the hunter's moon, tired but happy and "raring to go" the next day.

The October flowers, how rich and radiant they are in color. The dahlias and asters are the least afraid of Jack Frost. They wait every year for his nippy greeting.

All of a sudden we remember that the crickets and katydids have taken "French leave" of us. We are sorry we did not miss them before.

The late autumn days often begin at daybreak with a light tingle of frost, but by midday are golden warm. Then during mid-afternoon there comes a hint of evening chilliness, and we are reminded that we must wear a coat if we go out in the evening. Later, the hoot owl makes his presence known somewhere in the darkness.

Soon the colorful season will close and leave the woods bare and brown to old King Winter.

Says October:

"My ornaments are fruits,
My garments leaves
Woven like cloth of gold;
And crimson dyed.
I do not boast the harvesting of sheaves,
O'er orchards and o'er vineyards I preside.
The dreary air is full and overflows
With tender memories of the summer-tide."—Longfellow.

The Selection and Training of Operators

Selection of An Operator of Far More Importance Than the Training, for Careless Selection Causes More Trouble Than Careless Training—Paper Presented at Annual Traffic Conference of Illinois Telephone Association at Peoria

By Miss Irene Goodall,
Traffic Supervisor, The Illinois Telephone Co., Jacksonville, Ill.

The selection and training of operators may be a brief subject in discussion but it is a mighty task in practice; a responsibility wide, long, deep and lasting; a responsibility to your company, your subscribers, yourself and your other operators.

Naturally, the selection of an operator comes first, and while it does not claim the time, work, and patience required for training her, it is, in my opinion, of far more importance than the training. In fact, the training is so far secondary to the selection, I believe, that if a keen, bright, alert-minded, industrious girl were selected, it would be possible for her to sit down at the switchboard and, at a sacrifice of time and effort, absorb from her sister operators at least a working knowledge of operating practices, without training.

Selection is the big thing in acquiring new operators. I am not discrediting training, for I have worked as faithfully as my ability would permit at that branch of the business the greater part of my telephone life. I have trained operators long enough to know that I can make a rule determining the success or failure in that training, just in proportion as the selection of those operators was properly or improperly made.

So much importance do I attach to the selection of new operators, that I almost shudder at the responsibility of passing on new applications.

Chief operators, you may be sure that careless selection will make you more trouble than careless training, and I believe there is not a chief operator who would think for a moment of training a new operator in a careless fashion.

If she is to be an efficient, courteous member of your telephone family, if she is to fill all the requirements of one of the human units in your organization, if her work when mixed with your own is to go through your switchboard to a discriminating public as "our work," if you would be willing to trust her to contact a sometimes angry public as the representative of your company, if you can have the utmost reliance in her ability to everlastingly put through the "voice with a smile," and if you can know in your own mind that you can reasonably depend upon her in any emergency, then that operator just had to have some of the qualities, some of the natural fitnesses which Mother Nature gave to her long before your operating training ever began.

In our school days we learned the old proverb that "You can't make a silk apron out of a pig's ear," and if that proverb does not apply in the selection of new operators, then it does not apply at all. Old Mother Nature has a method of doing things in her own way, whereby she bestows upon some, natural fitness for one thing, and upon others, natural fitness for another thing. Had she neglected to bestow natural fitnesses upon operators, then we chief operators would be in an unfortunate position.

I want to examine by personal contact the applicant operator who is to become an important part of my telephone family. I want to approach her from every reasonable angle in order to discover whether or not she has the natural fitnesses which a high class operator must possess.

I would not select a new operator by correspondence under any circumstances, although I probably would want to have some correspondence about her before I finally selected her. I would not employ her if her father, mother, brothers and sisters, and all her other relatives and friends interceded for her, unless I could satisfy my mind that she had some native-born qualities about her which fitted her to absorb the training which I knew I must give her.

Chief operators, there is too much at stake to select operators in a lax fashion. If she were to be just another employe on the company's pay roll, just another operator to fill a place at the switchboard, just another girl whose identity would be lost in the sum total of our operations, it would not matter and in the old "horse and buggy" days, I suppose it did not matter much—but times have changed and the whole creation is going at a fast pace.

Some years ago, if a call were answered in ten or twelve seconds, it was regarded by the public as fair service—not today. Today, by the time the average subscriber gets the receiver adjusted to his ear, he expects to hear from the operator and if he had to wait ten or twelve seconds, the manager of the telephone company would get a call "pronto."

What has this to do with the selection of operators? Just this: The new operator may be a girl of excellent character, good breeding and manners, honest, industrious, clean in body and mind, kind and courteous; she may see well and hear well, but if she thinks slowly, acts slowly, and speaks slowly, she can never be the efficient operator which your long course of training should justify.

It is not enough that she has just a part of the natural fitnesses of a good operator—to be a high class operator, she must have them all. At least, she must not lack any of those natural qualities which her training cannot supply.

High class operators, like high class musicians and high class artists, are born, not made. Untold millions have been expended in vain by fond parents in an effort to make musicians, artists or professors out of their children, who never came through because they did not have the natural qualifications to take on training.

So it is with operators. Untold thousands of dollars have been paid to operators who received good training, but who would not or could not become high class, heart and soul operators. Instead, they became operators in name only and never did anything more than put up connections in a perfunctory manner.

Chief operators, just so long as we select new operators on any other basis whatsoever than natural fitnesses, just so long are we going to fail to raise the standard of operating practices, thereby defeating our own ambitions.

The selection and training of operators is a clean-cut, business proposition and is no small responsibility upon us. That responsibility, by virtue of the position we occupy, we must assume. If we accept the responsibility that goes with this position, then we must everlastingly keep our eyes fixed, and our standard set, on the caliber of operators which we make a part of our organization.

Nothing but merit should count. Inducements from the outside we should

ALONG THE LINE.

It's a wonderful thing—this thing that we call personality. It includes your appearance, your manners, your voice, your conversation, everything about you that impresses you on those with whom you come in contact as an individual, different from every other person in the world.

You do not have to be beautiful to have a charming personality. You do not need to be wonderfully clever, but you do have to be careful, courteous, clean, well informed, ready always to be at your best and to give people your best. Personality has paved the way to fortunes.—S. Roland Hall.

carefully avoid. Pressure is often brought to bear upon us from the outside—friendship, sympathy, politics, and religion are often used to induce us to give an operator a position, regardless of her fitness.

Let us suppose a case, which is not unlikely: Mary is an orphan in the town. Her relatives want her to have a self-supporting job so as to relieve them.

Her friends and acquaintances, through sympathy, want to see her located, and advise her to try our company for an operator's place; so she makes her application.

Her parents were good, responsible people, and she is not different. Her manners, dress, and language are good; her references are excellent, but she has no pep, no personality, no tact—pepless and tactless by nature. Can you, by any stretch of imagination, believe she will ever be valuable to our company, even after an unusual amount of time and patience in training have been given her? Never? But she is a poor girl and needs a position, and we need an operator.

Listen, chief operators, just so long as we select operators through sympathy or prejudice, instead of through natural fitness, we are going to run the dangerous chance of placing upon our company's payroll a liability instead of an asset. But there is a motive to be considered on the part of the chief operators in the selection of their students, and it is a selfish one. It is this: The higher class of girls we select, the more money they, and we, are worth to our organizations.

Native Qualifications for Operating.

You ask me what the native qualifications of the operator I select must be, and I will tell you. She must be **physically fit,** mentally alert, and have some individuality of her own. I would want her to have a good appearance, to be between 17 and 25 years of age, of reasonable height, and good arm reach.

I would want her to have good health, sight and hearing, and with no physical defects objectionable to others. I would want her to have at least an eighth grade education and, of course, would prefer more. I would try to ascertain what her aim in life is, and whether she is after the salary or the job. I would try to find out whether she is agreeable or contrary, by nature. I would not want a "yes, yes" girl; neither would I want one of an antagonistic nature. Above all else, I would try to discover whether she has that priceless quality of loyalty.

If I found in her all these natural fitnesses, in addition to faithfulness, industry and a willingness to learn, I would take her on probation, with the understanding that we were ready to begin the process of making her a first-class operator. I would tell her that this process was expensive to both herself and the company, and that neither desired to make a mistake. Then if it were found that either was making a mistake, it was time to discontinue the process and quit friends.

Observations on Training.

We have now selected a new operator and are ready to begin her training. In actual practice, I have never been quite able to draw a sharp line between the selection and the training of an operator. When able, if the operator is under my supervision during her training, I use this observation period as a checkup on my selection.

Primarily, of course, the purpose of the training period is to accustom the selected operator to the technique and practices of operating. It is necessary that she begin her training by acquiring voice technique, a knowledge of the switchboard, of multiples, of special features, handling plugs, etc., and a general information about the routines of operating practices.

While she is getting this informative training, and beginning her operating practices, I would still like to continue to observe her natural ability, so as to be able to confirm her selection.

As her operating training goes on, I am trying to observe whether or not she is sold on her job—heart and soul. I am trying to discover what her health habits are. Of course she has told me all these things in our conference before her selection, but I want to verify them.

I want to be confident that she will change such little perversities of her habits so as to conform to her new job. I do not expect her to change all at once, but I would be delighted to see in her a disposition to be willing to do whatever is necessary to make her the best.

Some one may say that it is none of the chief operator's business what her operators do after working hours. I consider it very much of my business what my operators do when not on duty. I do not propose to lay down a moral code for them to follow, but I am going to require that whatever they do in their outside activities shall not be in conflict with their efficiency as operators.

Let me illustrate what I mean: My company once had an operator who would have been an excellent one, except that she had a mania for dancing and she attended and took part in every dance where opportunity was afforded her. She just could not say "no."

Social Activities of Operators.

Now I heartily believe in a reasonable amount of social activities for operators, but I also believe that no operator can dance every night and efficiently operate every day. The one detracts from her usefulness as the other. I spoke to her about this, and while she did not say so in so many words, she intimated that I was interesting myself in her personal liberties. We did not argue the case, but, in due time, in the most graceful manner I could, I arranged it so that she could dance both night and day if she chose.

Let us proceed with our training. The preliminary training is best begun by the chief operator herself, for two or three very definite reasons: First, it establishes a good personal relation between the chief operator and the student. Then if the chief operator herself begins the training, a new operator's interest in her work is stimulated and she realizes authority behind the instruction she is receiving. This is especially true of instructions of a more or less general nature, such as accuracy, courtesy, care of equipment, promptness, etc.

There is no more fit person than the chief operator herself, to impress upon the mind of the student that discourtesy in an operator is the unforgivable sin, and that accuracy and speed are public good will builders. Who but the chief operator in person can explain to the student in a comprehensible fashion that in order to be the best operator, she must love her work, and that if her heart and soul are not in it, she must finally be a dismal failure to her company, her subscribers, and herself?

Completion of Training.

After the chief operator has personally selected the student, and directed the general principles of her training, then a capable supervisor may proceed with voice technique, book of instructions, operating phrases, the use of equipment, taking busy tests, etc., always remembering that the student operator learns better how to do things by being shown than by being told.

Make haste slowly by instructing in one thing at a time, and by being sure that that one thing is understood before proceeding. When the student does a good job, tell her so; and maybe a word of commendation from you to your old operators would not be out of the way, when they have earned it.

Remember, chief operators, every operator you have at your switchboard is in reality an operator in training, in a way, and when they have been in the service so long that they do not appreciate a word of praise from you, they are too old to be operating a switchboard.

Let us not weary in well doing. Let us exercise care, diligence, charity and patience in the selection and training of our operators, that as a reward we may enjoy to its fullest extent, a satisfaction in having benefited human kind in a four-fold manner: Our subscribers, our company, our operators, and ourselves.

Instead of trying to say it in my words, let me quote the words of Daniel Webster:

If we work upon marble, it will perish;
If we work upon brass, time will efface it;
If we rear temples, they will crumble into dust;
But if we work upon immortal souls, if we imbue them with principles, with a just fear of God and love of our fellowmen,
We engrave on these tablets something that will brighten eternity.

Outside Plant Men Talk Things Over

The Standards Handbook, 1932 Edition, Now Obtainable.

The Standards Yearbook for 1932 is full of suggestion and data for all engaged in standardization. It contains 400 pages, bound in blue buckram. The many aspects of the subject call for a concise summary for busy men who need to keep in touch with the latest advances in the standards field. The Standards Yearbook is designed to meet this need. It is prepared annually by the Bureau of Standards, U. S. Department of Commerce, Washington, D. C.

To the interest taken by several departments of the federal government in simplification and standardization, a special chapter is devoted. The first chapter of the book is devoted to standardization in communication—a symposium.

The Yearbook includes summaries of important national and international standardization activities and accomplishments of the government standardizing laboratories of England, France, Germany, Canada, Japan, and of the Bureau of Standards of the United States.

Another chapter is devoted to the standardization activities of American technical societies and trade associations.

An abstract of the work in standardization conducted by national standards associations throughout the world is another feature of the Standards Yearbook. There is also given a brief account of international cooperation in standardization.

The Standards Yearbook should be in the personal library of all engaged in work on standards, or concerned with their application. It may be obtained from the superintendent of documents, U. S. government printing office, Washington, D. C., for $1. To those living in foreign countries, the price is $1.25.

Bulletins for the Plant Bulletin Board During October

By Jake, The Lineman.

Mornin,' buddies!

Sumthin' jist tells me that it ain't gonna be long 'fore we'll be wonderin' why the furnace eats so blamed much coal. Sumthin' also tells me that a lot of folks will catch colds during this coming winter, which'll lay 'em up fer a spell. Jist ter sorta help you fellers stay well all durin' this winter an' not even know what a pesky cold is, I'm gonna give you a few bits of advice.

1. Cold baths increase yer resistance to colds. No matter how you shiver, it'd be good fer yer ter take a cold shower daily, preferably in the mornin.'

2. Work up a good sweat at least once a day.

3. Help clean yer system by eliminating freely at least once a day.

4. Get more good, restful sleep durin' the winter months than you do in the summer months.

5. Don't overload yer stomach.

6. Get out in the sun as much as possible each day.

7. Drink plenty of water.

8. Dress according to the weather.

9. Avoid c r o w d e d and over-heated places.

10. If you do catch a cold don't ignore it.

There're just ten little rules, but if you'll sorta remember 'em they will do a lot toward keepin' you feelin' good all winter.

Now, what say we have our weekly laugh 'fore I start on the bulletin board signals:

A negro was givin' his friend's horse a general inspection.

"Sambo, did I unnerstand you all to say dat hawse is lazy?"

"Lazy? Man, looka dat fly on his nose. Pestahs him consid'able, but he's waitin' till they's two or three befo' he bothahs 'bout sneezin' 'em off!"

This month I'm gonna carry out some good advice which I received from one of our buddies out in California. He suggested that durin' October the bulletin board signals carry just one thought designed to make whoever reads it think about Safety. In accordance with his suggestion, here are a bunch of bulletins which ought ter set the reader ter thinkin':

October 1: Safety pays dividends of health, long life and happiness. Accident pays no dividends but robs its unfortunate stockholders of money, time, health, happiness, security, and even steals their lives and thus darkens the futures of those who loved and depended upon them for support. Which stock are you going to buy?

October 3: "A nail is driven out by another nail; habit is overcome by habit."—Erasmus. Why don't *you* drive out the habit of carelessness by developing the habit of safety?

October 4: Five Poor Excuses:

1. I forgot.
2. I meant to.
3. It slipped my mind.
4. We all make mistakes.
5. I didn't have time.

Remember them if you ever have to explain "why" an accident happened!

October 5: "Your sole contribution to the sum of things is yourself."—Frank Crane.

It's up to you whether our safety program fails or succeeds! Make it your aim to contribute a perfect "no-accident" record for yourself.

October 6: There are two sides to every question. So are there two sides to a sheet of sticky fly paper—but it makes a lot of difference to a fly which side of it he chooses to stand on.

It makes a lot of difference to you and your future with this company if you choose the wrong side and ignore safety.

October 7: Life is somewhat like a journey. If you're going very far you'll need some extra baggage. Always include a big parcel of safety to help you through the journey of life, and your journey will be more enjoyable.

October 8: "Self-confidence is the first requisite to great undertakings."—Samuel Johnson.

Study your job until you are sure that you know it thoroughly. When you know it thoroughly you will know how to do it safely and when you know all the safety requirements of your job then you can be self-confident that no accidents will happen to you.

October 10: "How much easier our work would be if we put forth as much effort trying to improve the quality of it as most of us do trying to find excuses for not properly attending to it."—George W. Ballinger. Need we say more?

October 11: During 1931 nearly 97,000 people were killed by accidents. Nearly 11 people were killed every hour! Watch yourself! One careless move and you may be among the next.

October 12: You probably have hopes of giving your children a good education! Suppose an accident should take you away, could they still obtain that good education or would they be handicapped by not obtaining it?

October 13: When you purchase something you expect to use that object and desire some benefit from it. When we purchase safety equipment we expect all employes to use the articles and thus we can obtain some benefits by having the cost of "accidents" reduced. If you don't use the equipment, we have wasted our money!

October 14: You are with us eight hours, practically, every day. Why not spend those hours doing your work safely? If you do spend them safely, you'll find yourself observing safety at both work and play.

October 15: Despite the advent of machines, judgment and tact are still human attributes. Exercise them and you will benefit from using them!

October 17: It's a good thing to remember that half-trying is better than no trying at all!

October 18: Today is a good time to start preparing to give Ole Man Accident the licking of his life during 1933! Start training yourself to do all things safely so that January 1, 1933, will find you a safety-trained worker!

October 19: Your ideas are just ideas until you give them a trial. If you have an idea for something which will help safety along, let us make a reality out of your idea!

October 20: Satisfactory results are the greatest confidence building factors known. Keep that in mind and remember that each month without an accident builds up enough confidence in safety to help boost the next month by.

October 21: It's our observation that common sense isn't half as common as it should be. Lack of common sense causes a number of unnecessary accidents!

October 22: The course of human events is forward, not backward! Are the accidents which you have pulling you back from the job you would have if your record was perfect? Think it over!

October 24: It will not do you a bit of good to fill your mind with safety ideas and then fail to use those ideas. That's

the trouble with thousands of humans—they fail to use what they've got in their heads!

October 25: Nine times out of ten, after an accident, the party in the accident usually laments, "If I had only done——." Don't be an "If" man! Resolve to be a "Do" man!

October 26: Leave your worries behind you when you start out on a job. Many an accident has been charged up to "Worrying over family difficulties."

October 27: There's one thing that no one can take away from you and that is your reputation of being a "safe worker." There's another thing which only you can remove and that is your reputation of being a careless worker! Think those two statements over.

October 28: Why should you take a chance and thus give "Ole Man Accident" a chance to halt your progress towards the goal you wish to attain?

October 29: "Live today for you may be gone tomorrow," has been changed to fit the case of the careless worker and it now reads:

"Live as long as you can today for tomorrow they will bury you!"

October 31: Most of us are judged by what we do and not by what we could have done Think that over! See how it applies to safety.

There are yer signals an' I hope a lot of bulletin boards carry them durin' October. I'd like suggestions fer November. What do you think would be good?

Well, I'll be ramblin', but I'll see you again Saturday. By the way, "Clean Up the Hazards Week" ended today. Send yer list of hazards in as soon as possible!

Use as yer safety thought durin' the coming week: "Safety plus 'me' equals 'no accidents,' but separate 'me' from safety or safety from 'me' and an accident is gonna pop up."

So long! Take care of yerself!

Cable Rings Get Better; Lengthen Cable Life Many Years.

By The Old Cable Splicer.

We old-timers in the telephone game had no end of troubles with defective material and equipment in our struggle to furnish a satisfactory grade of service to our subscribers. Perhaps the greatest of these worries was in the finding of a satisfactory method of attaching the lead cables to the messenger strand.

The first aerial cable I ever saw was laced to the messenger with marlin. The Western Union had a machine to do this job which was called a "spinner." Then came the marlin hanger. This was merely a loop of marlin which was hitched around the cable and attached to the messenger by means of a wire hook. These were never satisfactory, for they required replacing frequently, and in the interest of economy, we tried to make them last as long as possible.

Due to this Scottish instinct, we sometimes left them in service longer than we should. A few would break and add weight to the next one, which would break it; and we would awake some fine morning after a hard wind and find several spans of cable on the ground, never a pleasing sight.

Next, someone brought out a metal ring which required a crimping tool to attach it to the messenger. The greatest trouble with these rings was that they never gripped the messenger tight enough, and they had a tendency to bunch up so it was necessary to replace them frequently. They also had a large contact surface with the cable which caught grit and dirt that acted as an abrasive. Then the sway of the span caused a twist of the cable at the pole, and it was not uncommon to find rings cut into the paper insulation at each pole over the entire length of the cable. These old metal rings were never as smooth as they should be, either.

There has been marvelous improvement in cable rings during the past few years which gladden the heart of all cable men. The contact surface between ring and cable is smooth and so small that there is very little chance for dust to collect and never in harmful quantities. Rings are also shaped so that cable has very little chance of twisting at the poles, and ring cuts are uncommon. They also clamp the messenger tightly so there is no chance of their slipping.

There is only one trouble which I can mention in connection with the modern cable ring; that is their great affinity for one another, for they tangle like static. Tumble a bunch of several hundred out of a burlap bag; to separate one from the bunch, one must shake them like a dog shaking a rat. Nowadays rings are generally strung on a wire like fish on a string, for the lineman to carry while attaching them to the messenger. Many rings are lost both in the struggle of unscrambling and by the lineman while installing them.

Manufacturers have done much to improve this tangle trouble by packing in smaller packages, for a small bundle is much easier to unscramble than a large one.

The latest idea along this line is to nest five rings together with a piece of cardboard, which is easy to remove when the rings are being installed. This makes it very convenient to count the rings; it is impossible to tangle them, and the loss is reduced to almost nothing. They could not improve the ring, so they improved the method of packing.

Improved cable rings are only one of many of the things which contribute to a better telephone plant today than in years gone by, but I doubt whether there is anything more important, for they lengthen the life of aerial cable many years.

Booklet on Foremen's Safety Conference Suggests Programs.

Deer Buddies:

I've jist finished readin' a little booklet entitled "Foremen's Safety Conference," a brand new publication which wuz issued by the policyholders service bureau of the Metropolitan Life Insurance Co. It is so chuck full of valuable hints, showin' how ter enkourage and develop safety interest among foremen, that I thot sum of you fellers would be interested in gittin' a copy of it.

The booklet fully describes suggested programs for a series of seven informal conferences to discuss the various phases of safety work, the meetings to be presided over by some representative of the management—an' believe me, buddies, the conferences are so arranged that enny telephone company that decides ter hold them, is bound ter git a world of good out of them.

In order ter bring out a general discussion, a series of nine questions is presented fer each of the seven conferences. Follow'in' each question is a short komment givin' the purpose of the question and general information about the subjeck asked about.

The followin' subjecks are covered in the program: The reasons for safety work; using facts to prevent accidents; getting the new employe started right; helping the 'accident prone' employe; getting the department behind the foremen; the value of safeguarding equipment and the effect of good housekeeping on safety and operation.

I'd advise all of you fellers who are really interested in safety, ter obtain a copy an' study every word in it carefully.

A limited number of copies are available for distribution to executives, safety engineers an' others who may be interested in accident prevention. You kin obtain a copy by addressin' the policyholders service bureau, Metropolitan Life Insurance Co., One Madison Avenue, New York City, and askin' 'em ter send you a copy of "Foremen's Safety Conferences."

By the way, you might kinder mention that Jake, The Lineman, told you about the article in Telephony, an' after you git yer copy I'd like to know what you think of it.

Yours fer a "No Accident Record,"

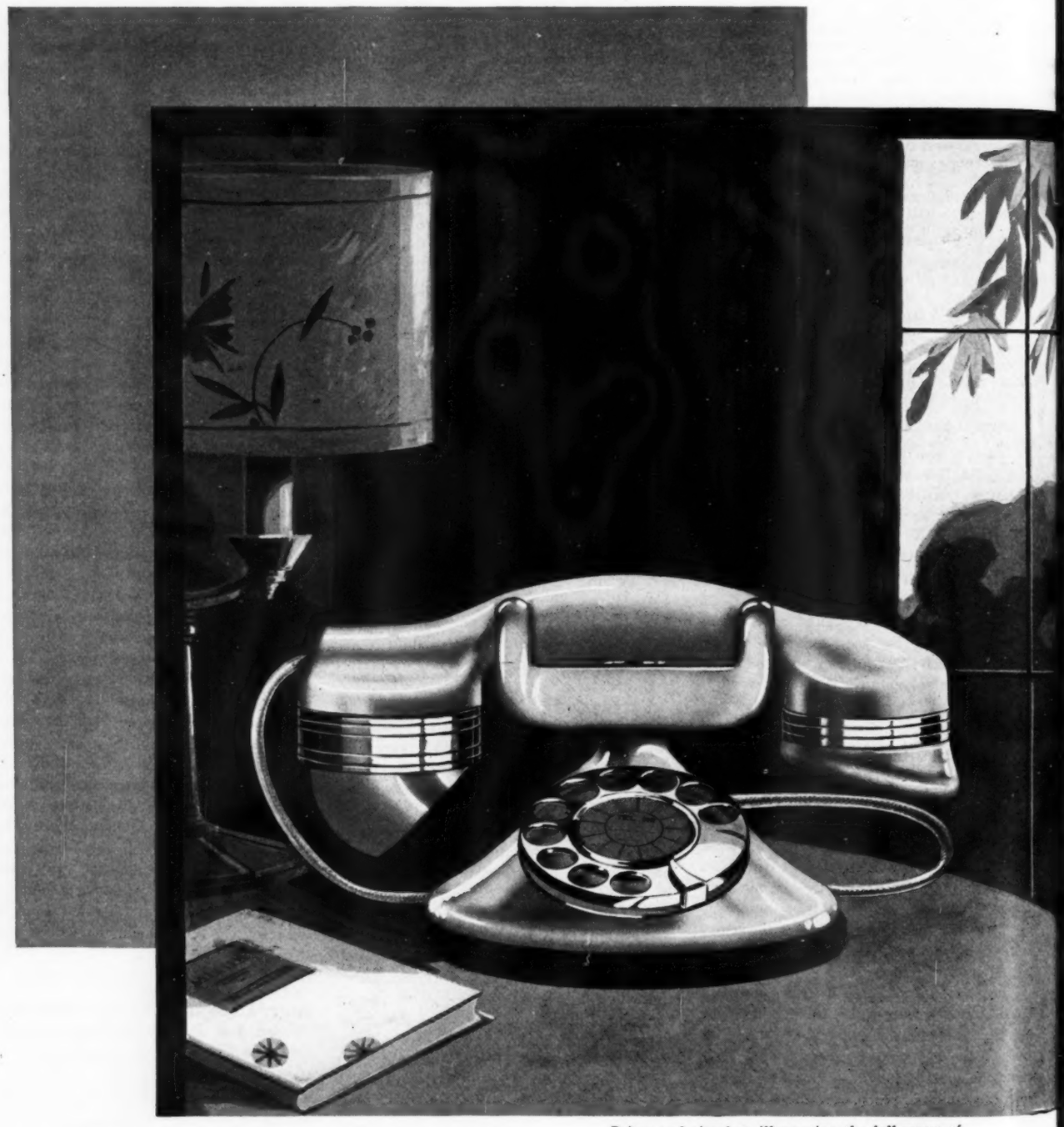
Jake, The Lineman.

Sign Language Interpreters Needed for Long Distance Call.

Oscar Burton, general manager of the Gulf States Telephone Co., Tyler, Texas, describes a recent happening at Athens, Texas.

A call came in for a person who was reported deaf and dumb. The calling party selected an alternate who, at the time, was unable to use the telephone because both arms were broken.

The calling party selected a second alternate who was reported in jail; whereupon the Athens toll operator was asked if there was anyone in Athens who could talk over the telephone.



Prices and circulars illustrating the full range of colors will be promptly furnished upon request.

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The Monophone in color is available either with dial, as shown in the illustration, or for manual service, with a neat and attractive number card holder, for which a dial can be substituted at any time. In your drive for increased revenue do not overlook the proved sales appeal of this beautiful telephone. SHOW it to your subscribers. You will be agreeably surprised at their enthusiasm.

"Modern Telephone Services for the Modern Age" is the title of a new booklet on auxiliary services. Send for your copy today.

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Here and There in Telephone Work

Testamentary Newspaper Advertising of an Oklahoma Company.

The Oklahoma-Arkansas Telephone Co. at Poteau, Okla., has recently been using a series of testamentary advertisements. Two of these advertisements are reproduced on this page and show the form used. The use of complimentary letters in the company's advertising undoubtedly helps to improve public relations.

Letters from various business organizations, testifying to the value and excellence of the telephone service, when given such publicity, do much to overcome the utterances of those who for political or other reasons disparage the company or its service. When such evidence of a company's standing with leading business establishments and organizations is publicly presented, undoubtedly a favorable reaction follows.

100 percent Service
LeFlore County Sun
"The Voice of LeFlore County"
POTEAU, OKLAHOMA
Oklahoma-Arkansas Telephone Company
Poteau, Oklahoma.
Gentlemen:
We are expressing our sincere appreciation for the splendid service you gave us in receiving county returns for the Run-Off primary on July 26, and do not hesitate to say that it could not have been better.
Between six and 11 o'clock on the night of the election, returns from 24 precincts were received by long distance at this office, each coming in distinct and clear.
The additional telephone you so kindly installed at this office eliminated all delays, and our representatives in the various precincts state they received prompt and efficient service.
In expressing this appreciation, we also are speaking for the more than two thousand people assembled that night in front of the Sun office, eager for information and depending entirely upon the efficiency of your telephone system, service and cooperation.
Respectfully yours,
THE LeFLORE COUNTY SUN
"The Voice of LeFlore County"
OKLAHOMA ARKANSAS
TELEPHONE COMPANY

The BEST Service He Has Ever Had
THE HOTEL LOWREY
FIREPROOF
J. M. BERRY, Mgr.
POTEAU, OKLA.
Oklahoma-Arkansas Telephone Co.,
Poteau, Oklahoma.
Gentlemen:
I want to compliment you on the splendid service your company is giving this hotel, and express the appreciation of my guests and myself for the untiring effort your personnel exerts in extending every accommodation possible.
I have operated hotels in various cities, some of which are much larger than Poteau, but I frankly say that YOU ARE GIVING ME THE BEST SERVICE I HAVE EVER EXPERIENCED.
Very cordially yours,
J. M. BERRY, Manager
HOTEL LOWREY
OKLAHOMA ARKANSAS
TELEPHONE COMPANY

Reproductions of Testamentary Advertisements Which Should Have a Beneficial Influence on Subscriber and Public Relations.

Klondike; the Lure of Gold as a Vacation Pastime.

[EDITOR'S NOTE: Gold-hunting has always had a strong fascination for men everywhere. Since 1929 many unemployed in the West have seized the opportunity to make the adventure and have gone "prospecting" with varying success. In many regions these amateur miners have washed out day wages in the placer diggings. The following letter tells how one California telephone man utilized his month "lay-off" by joining the gold-diggers.]

We have had the depression with us so long that we have often thought if we could get far enough away we might not be continually reminded of our troubles and might even recover, at least within ourselves. When the orders first came out to take a few days a month off from our telephone duties, we were glad of the chance to get a few of the odd jobs done around the house; but as the number of days increased, we commenced to look for something that would be profitable.

There did not seem to be much that had any value except gold. As we heard from different linemen of the trips they took to nearby canyons with the gold pans as their tools, we thought there might be a chance to at least spend our time. Packing as much cheap gas in the old bus as we could, and with a good supply of the usual standby provisions, we started out.

Placerita canyon being our closest, we arrived there shortly with very little hardship. Here we found a small stream of water, some gravel in a small bed with plenty of men armed with gold pans trying to find a few colors. After watching the others for some time, we learned the knack of whirling the pan around with its sample of gravel. Then looking in the black sand for even the smallest particles of the yellow metal, we soon became seasoned prospectors.

Moving up stream a short distance we found two mechanics working with a machine operated by a gasoline engine that would shake the gravel back and forth as the water was poured over it with an automobile water pump. In fact, the machine was made of automobile parts throughout and apparently worked fine. The owners said they were not very successful because the gravel was not rich enough. Then we found another miner who had been here some time and had a very few small grains of gold in a bottle.

He told of a survey he made at one time to trace mineralized land from the ocean to the desert; how he learned from an Indian of a dry canyon where he claimed that after a cloud-burst he found $3,200 in gold in one small pocket. The thought then came: Why not follow this lead and get away from people on our next trip?

Back to the desert we headed the next week to a place which we had passed several times as a deserted mine and had always wanted to investigate. Everybody who goes through the Mojave Desert has seen old mines on the west side of the main road from Lancaster. Here we found an old-timer in charge, who had lived there 30 years. Most of the dumps were old silver mines and, on account of the price of silver, were idle at the present. There was some gold in quartz a short distance over but they had all the help they needed and were making a fair living.

Of course, we noticed he had a telephone line and after a few questions we found that years ago he had connections with the outside world at $1.50 per month. Then on account of the few subscribers the company had raised the rates higher and higher until they reached $5.00 per month and he had his service disconnected from the outside. He owned his own line and sure had a lot of hard words for the utility.

Here we also met an old prospector who knew of a "sure enough" mine in Nevada. As we had six more days off this month, why not take the old fellow up to his rich placer diggings? We were sure of some knowledge of mining on the trip up, and we might strike something worth while. We found the road fine till the last 50 miles across the desert. The prospector had been to this place before, but there was so little travel over the desert and through the sage brush that we were several hours making the last lap of the journey.

We made camp on a patch of green grass beside a small stream of water and started working the day after we arrived. Most of the gold we found in our previous experience was down near bed rock. So we located what we thought was an old stream bed and started digging holes for a deep dead man. Each foot we went down, we would take a panning.

We were greatly surprised to get colors from the surface of the ground down, and concluded that the next day we would go to a deserted mine we had heard of and find enough lumber for a sluice box. We were told that it was about nine miles to

the old mine. After we had gone eleven miles we found an old Indian who proved very interesting. He had not been to town for over a year and was living with some horses and chickens all by himself. Here, at least, was a man who had not heard the depression was on. We found the old mine had been sold for taxes several years before and still had several thousand dollars of buildings and machinery on the ground.

Here we saw a telephone on the wall and, it being a magneto grounded service, we wanted to try it out. Sure enough the operator answered the first time we cranked. Here was service 55 miles from town without even poles part of the way and nobody using the facilities.

Well, we found the lumber, hurried back to our diggings and built our sluice box. The next day we ran about four yards through the box, and found gold digging a lot harder work than we had expected. We had to ditch our water quite a distance and it all meant shoveling.

We cleaned our sluice box the next day and started back to civilization with lots of experience and a small bottle of gold. We had done our location work and as we passed through the county seat, filed our claims. Here we have at last found something to work at in future vacations, and we may strike some big nuggets as we work up the canyon. Of course, the trip did not pay this time; we only had $5.50 worth of gold but the experience we had was valuable to us.

Los Angeles, Calif. RICHARD ROBERTS

Iowa Company Endeavoring to Collect for "Borrowed Service."

A new policy was put into effect in August throughout the system of the Middle States Utilities Co., of Cedar Rapids, Iowa—that of charging non-subscribers 5 cents for each telephone call placed over the telephone of a regular subscriber. The toll is charged on the monthly bill of the subscriber, one-half of which is returned to the subscriber and one-half retained by the company.

A close check is being kept by the local operators, and if a strange voice is heard, they are liable to ask: "Who is calling"? If it is not a member of the subscriber's family, an O. K. by the subscriber will be requested.

The move has been made necessary partly because so many people have had their telephones taken out and are now using their neighbor's telephone, thus crippling the service. In some instances one telephone answers the need of an entire neighborhood, it is stated.

The new ruling has further been put into effect, according to R. R. Coffman, district manager, to protect subscribers, complaints from whom have been frequent. Especially is this true with business telephones, which are often blocked by non-subscribers for long periods, thus interfering with the proper transaction of business. Regular customers of a store or other business are not denied the average use of their telephones.

Interesting Data From Reports of Class A, B and C Companies.

A grand total of $95,528,036 was paid out in taxes by 110 Class A telephone companies during 1931, according to a compilation of selected financial and operating data recently completed by the bureau of statistics of the Interstate Commerce Commission from annual reports received from telephone companies for the year ended December 31, 1931. This represents an increase of $4,583,654, or 5 per cent, over the grand total of taxes paid by 112 class A companies in 1930.

A grand total of $1,190,762 was paid out in taxes by 90 class B companies in 1931. This represents a decrease from the 1930 figures for 100 class B companies of $126,323, or 9.6 per cent.

A class A company, under the Interstate Commerce Commission's classification, is one reporting gross annual operating revenues of $250,000 or more. A class B company is one reporting from $100,000 to $250,000 gross annual operating revenues and a class C company is one with a gross annual operating income of $50,000 to $100,000.

In 1931 class A, B and C companies (totalling 311) reported a grand total of 86,670,262 miles of wire, as compared with 82,782,638 for 339 class A, B and C companies in 1930. Other compilations of statistics for A, B and C companies for 1931 with comparative figures for the preceding year are as follows: Investment in fixed capital, $4,619,075,813 and $4,445,139,058; other investments, $2,830,718,339 and $2,658,090,729; cash, $76,624,339 and $131,701,672; material and supplies, $31,300,887 and $32,787,766; total working assets, $490,466,323 and $636,530,863.

The capital stock of class A, B and C companies totalled $4,391,871,979 in 1931 and $4,198,609,906 in 1930; unmatured funded debt was $1,112,821,703 and $1,177,675,908; total working liabilities, $368,190,343 and $356,898,537; accrued depreciation, $845,320,269 and $792,021,335; total corporate surplus, $656,006,427 and $654,481,661; operating revenues, $1,179,659,562 and $1,209,664,793; operating expenses, $795,375,633 and $831,499,531.

Other than federal government taxes on telephone property of class A, B and C companies totalled $74,203,971 in 1931 and $69,481,542 in 1930; United States government taxes, $22,516,330 and $22,792,004; total taxes on telephone property, $97,243,779 and $92,854,847; operating income, $279,187,608 and $277,134,875; net income, $355,526,857 and $349,157,741; dividends declared, $340,133,643 and $300,448,767.

Class A, B and C companies had 755,391 miles of pole line in operation in 1931 and 738,221 in 1930; miles of wire in aerial cable, 24,962,484 and 23,306,243; total miles of aerial wire, 6,379,451 and 6,552,959; total miles of phantom circuit, 2,410,982 and 2,239,650; miles of trench, main conduit only, 28,153 and 26,359; miles of single duct, 134,561 and 128,726; miles of wire in underground cable, 55,138,975 and 52,744,012; miles of wire in submarine cable, 189,352 and 179,424.

Central offices operated by Class A, B and C companies at the close of 1931 totalled 11,044 and 10,827 in 1930. This total included 6,757 magneto switchboards, 3,227 common battery, 45 automanual and 1,015 dial automatic switchboards in 1931 and 6,742 magneto, 3,209 common battery, 45 automanual and 831 dial automatic switchboards in 1930.

The company stations operated by the 311 class A, B and C companies reporting to the Interstate Commerce Commission for the year ended December 31, 1931, totalled 17,573,266. There were also 103,088 private line stations and 425,141 service stations, making a grand total of 18,101,495 stations. In 1930 the company stations of the 339 class A, B and C companies reporting to the Interstate Commerce Commission totalled 17,903,844; private line stations, 103,827; service stations, 430,494, making a grand total of 18,438,165.

The average number of local exchange messages originated per month by class A, B and C companies in 1931 was 2,488,069,590, as compared with 2,533,492,599 in 1930. The average monthly originating toll messages of 86,837,443 in 1931 compares with 93,919,823 in 1930. The average number of stations in service in 1931 was 17,817,608 as compared with 17,929,067 in 1930.

The total number of employes in the service of these three classes of companies at the end of June, 1931, was 345,151 and the total at the end of December, 1931, was 332,183. In 1930 there were 398,298 employes in service at the close of June and 364,732 at the close of December.

Telephone Conditions Improving in Nebraska; Selling Arguments.

Telephone and telegraph officials in Nebraska report that business has been slowly but steadily increasing since the latter part of August, and that every indication points to a continuance.

President W. B. T. Belt, of the Northwestern Bell Telephone Co., says that the turning point was reached in that month, and that he looks for a continued rise. In the past business recovery did not get under way in the section covered by his company's operations until three to six months after it had started in the east.

W. E. Bell, commercial superintendent of the Lincoln Telephone & Telegraph Co., says that definite signs of improved business are multiplying. Toll revenues are increasing, although not steadily; one day will record a satisfactory increase and the next day revenues will be back at the low

level. The low point of telephones in service has apparently been passed.

A number of installation orders were received during September from farmers who have been compelled to cut every corner and have done without service as long as it was possible. A number of orders and promises of orders were received last month for reinstallations early in October.

A gratifying part of the undesired experience of the last year or two has been that very few of the farmers made any suggestions or objections to rates or service, making it apparent that these questions do not enter into the situation. Most of the farmers discontinuing have said they did so for financial reasons.

A considerable proportion of the farmers in Nebraska own their lands free of mortgages, and most of these did, as prudent business men did in flush times—they laid up a reserve for use during the times through which the country has been passing In addition, many of them have one or two years of corn production in crib, and a number have wheat they have been holding for better prices.

One curious situation has developed. A few years ago, when the successful drive was made by telephone companies in Nebraska for the placing of service in rural school houses for the protection of teachers and pupils, one selling point was the number of connections available when help of one sort or another was needed. Now the argument is reversed. With most of the rural schoolhouses equipped with telephones, it is evident that their value rests upon the number of connections; and the need of these is the opening wedge for sales of home reinstallations.

Special attention was paid during August and early September to the campaign for service in rural school houses, and the radio, newspaper and direct mail forms of advertising were used, with the result that the reports show that practically every schoolhouse thus equipped in 1931 is again getting service, with additional sales effected in other districts.

In this work for all the companies, State Superintendent of Schools Taylor has been helpful and cooperative. He has called attention of teachers and superintendents to the protective character of this service and the need of it. Many difficult situations arise during school hours out of sickness and sudden, unsuspected developments at home or school that can be avoided or disposed of promptly where telephone communication exists.

Traffic conditions on the highways have also added to the urgency of the need for this service. Paved roads are constantly increasing in mileage. This brings with it an increase in the number of hitch-hikers and other strangers who use them for their purposes and who constitute a menace to the safety of school children and teachers.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

City of Little Rock, Ark., Enjoined from Enforcing Rate Reduction.

On September 26 at Little Rock, Ark., Federal Judge John E. Martineau granted the Southwestern Bell Telephone Co. a temporary injunction against the city of Little Rock. The injunction restrains the city council from enforcing a recent ordinance it passed ordering the Southwestern Bell company to reduce its local rates.

The Arkansas Railroad Commission does not have jurisdiction over local rates.

Assessment of $125,000 Against Wisconsin Utilities Challenged.

Constitutionality of the assessment of $125,000 against Wisconsin utility companies by the Wisconsin Public Service Commission for the cost of investigations was questioned on September 26 in an objection filed by the Wisconsin Telephone Co.

The objection was entered during a conference between utility officials and the public service commissioners on methods of administering the assessment of costs under the 1931 "strict regulations" law. The law authorized the assessments but difficulties were encountered in detailing them.

The $125,000 represents the costs of investigation which could not be definitely charged against specific utilities.

Objection to the assessment was based on the grounds that it amounts to a tax, would be in violation of the rule of uniformity of taxation, would deny equality, would be without the due process of law and in violation of the 14th amendment.

During the hearing utility officials heard John Bickley and Miss Ann Alinder of the public service commission explain how the gross income of the utilities was determined as the basis for assessment. Utilities officials asked time to study the assessment figures.

Decrease Ordered in District of Columbia; Depreciation Interest.

The Public Utilities Commission of the District of Columbia on September 16 ordered a 10 per cent cut in all telephone bills in the district for service to be furnished after September 30, except for private branch exchange service where a switchboard is supplied to subscribers. Apartment houses, business concerns and others, where more than one telephone line is in use, are usually equipped with these private branch exchanges. The rate reduction does not apply to them, but only to persons with private line telephones.

The cut was ordered by the commission as a result of extended public hearings which started June 15.

The commission found the rate base on which the company is entitled to earn a reasonable return cannot be greater than $29,400,000 and that under present conditions a rate of 6 per cent is reasonable. The commission found further that the company's net revenue for the current calendar year, based on the rates ordered, will be not less than $1,800,000, and for the 12 months ending June 30, 1933, not less than $1,900,000.

It found these prospective earnings under the rates will return to the company not less than 6 per cent upon its rate base, will allow the company to pay all of its fixed charges, to pay dividends of not less than $6 per share on all outstanding stock and to carry a balance to surplus. All these transactions can be carried out, in the commission's opinion, without the necessity of the discharging, or reducing wages, of any employe.

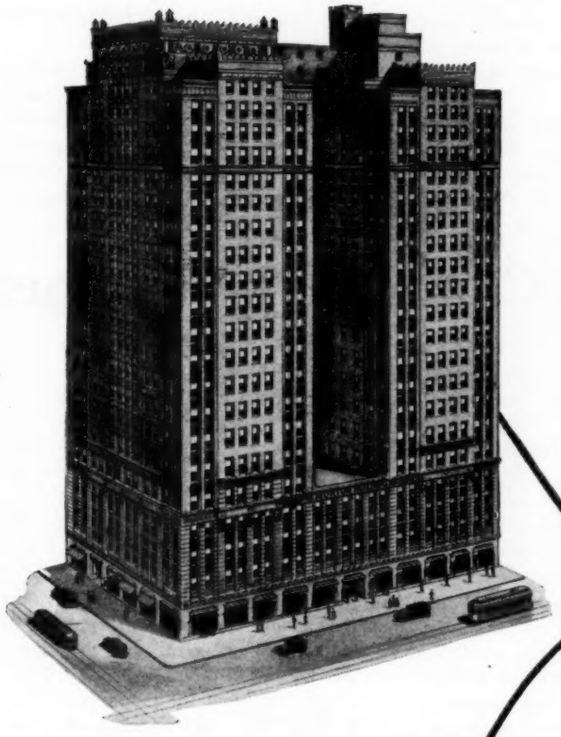
The valuation found by the commission is about $7,000,000 less than that claimed by the company. With its order, the commission issued a lengthy resume of all evidence submitted and arrived at the conclusion that the $29,400,000 fixed is generous.

One of the main points of contention

Answers to the Traffic Questions Presented on Page 14.

1. You do not hold the circuit when you receive a report that the called party has a non-published telephone. Acknowledge the report by saying, "Right," clear the toll circuit and give the report to the calling party.
2. The recorder's number is always entered on the ticket. If the operator who records the call does not complete it, the operator who completes or disposes of the call, enters her number and draws a line through the recorder's number.
3. That depends upon the nature of the report. A call must be passed without delay to be classed as a CLR call.
4. The rate is encircled when it is quoted.
5. This question is answered in the introduction to the questions and answers.

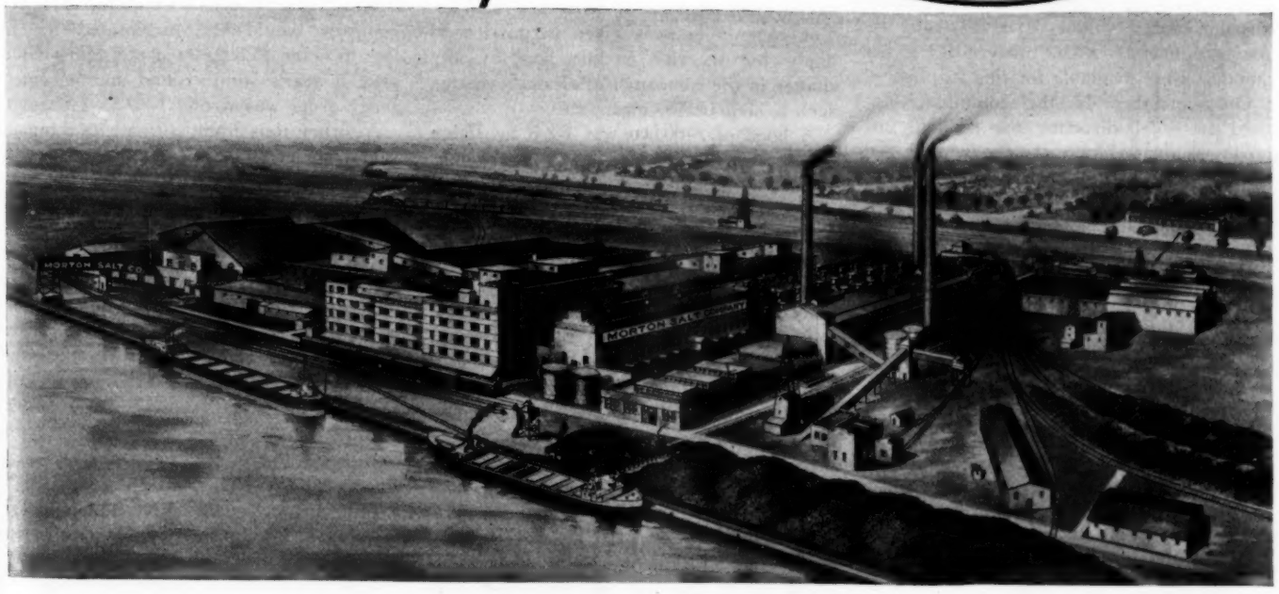
Big Salt Company Flashes Orders to Far-Off Plants with Teletype



The Morton Salt Company, one of the largest manufacturers and distributors of salt in the world, is an enthusiastic user of Teletypewriter Service. It employs Teletype to flash orders and changes in orders from its general offices in the Morton Building, Chicago, to plants at Port Huron and Manistee, Michigan, respectively 334 and 300 miles distant.

Says an official of the company: "Teletypewriter Service makes it possible for orders received in Chicago in the late afternoon to be shipped from Port Huron or Manistee the same day. We like the extreme accuracy of Teletype, and the savings which it has accomplished over previous methods of communication have amazed us."

If there is in your city a business concern whose office and factory are widely separated, you will find it to be a live prospect for Teletypewriter Service. On request, we shall be glad to aid you in selling such service, either by providing descriptive literature or by giving you the personal assistance of one of our sales engineers. Address the Teletype Corporation, 1400 Wrightwood Avenue, Chicago, U. S. A.



Port Huron, Michigan, plant of the Morton Salt Company

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was a claim by the company of $4,000,000 as representing "going concern value." On this head the commission stated that it has "included an amount which it believes will be just and reasonable" without stating what the amount is.

The commission finds an investment cost of the entire property of $32,000,000.

Part of the long opinion of the commission is a finding that the 1½ per cent of certain items of telephone operating revenue paid by the Chesapeake & Potomac company to the American Telephone & Telegraph Co., under the license and service contract, should be charged 60 per cent to operating expenses and 40 per cent to fixed capital.

In the matter of accruing reserves for pensions and retirement pay, the commission questioned whether the accrual at the rate for 1931 ($180,861) is appropriate. It suggested that the amount be decreased and that the annual accrual need not be more than $100,000.

The opinion also concluded that the company's accruals for depreciation are too great. It pointed out that the existence of an excessive retirement reserve tends to promote the retirement of property before its useful life has been exhausted and the substitution of more costly property of later design, thus adding further to the fixed capital which places additional barriers in the path of reduced telephone rates.

The opinion pointed out that since 1920, the company has transferred approximately $3,510,396 to surplus at the average of $292,000 per year, and that the highest amount so transferred was $695,600 in 1931. Speaking of this surplus, the commission said it would be no hardship if, for a time at least, materially lesser amounts were available for this surplus.

On September 17 the commission issued an order directing the company to credit its depreciation reserve with 5 per cent interest a year, computed monthly. The reserve, now between $6,000,000 and $7,000,000, is built up by monthly accruals from operating expenses. The 5 per cent interest will be deducted from the monthly accruals.

During the hearings, the company testified its depreciation reserve was invested in plant and since the plant had never earned less than 5 per cent the commission decided it would be fair to charge that figure to interest.

Attaches of the commission said the effect of this would leave some $300,000 to $350,000 a year available for another cut in rates, since this money under the old system went into operating expenses.

Rates Too Low in Tennessee, the Southern Bell Company Says.

Countering with the allegation that its rates are too low already, the Southern Bell Telephone & Telegraph Co. on September 12 filed its answer to a petition asking the Tennessee Railroad & Public Utilities Commission to order telephone rates lowered throughout Tennessee.

The petition was filed recently by Fred M. Williams, Chattanooga lawyer, who charged that the company had earned as much as 13 per cent on its investment and asked that its rate of return be reduced to 7 per cent. As grounds for this, Mr. Williams averred that the purchasing power of the dollar is 40 per cent higher than in former years and that the company has effected numerous economies in operating costs, which, he asserted, should be passed on to consumers.

Replying, the company said in part:

"Defendant is earning less than 6 per cent on the value of its property in Tennessee devoted to intrastate telephone service. Eight per cent on said property, after providing for all operating expenses, taxes and depreciation, with one or two per cent over for contingencies, is a reasonable return upon said property.

Even the present rates allowed by this honorable commission and charged by defendant for its intrastate telephone service are confiscatory of the property used and useful therein. Defendant's rates for telephone service should not be reduced, but if any change is made in same, there should be an increase."

"To lower rates," the answer continued, "would produce an unreasonable low return and would confiscate said property and deprive this defendant of its property without due process of law, in violation of the provisions of the 14th Amendment of the Constitution of the United States."

Wisconsin Commission Enjoined

Statutory Federal Court Issued Injunction Restraining Commission From Enforcing Order Reducing Rates of Wisconsin Bell for One Year—Order Claimed to Cut Earnings One-Half

On September 21, at Madison, Wis., three United States judges granted a temporary injunction restraining the Wisconsin Public Service Commission from enforcing its order of July 1 reducing the exchange rates of the Wisconsin Telephone Co. by 12½ per cent for a period of one year.

The court placed the company under an unsecured bond of $1,000,000 for protection of subscribers pending final argument on the question of a permanent injunction, preparation for which, company attorneys stated, will require at least six months. The commission was given permission to apply for security on the bond if any change in the company's affairs necessitates such a step in the meantime.

A bond of $100,000 was fixed by Judge F. A. Geiger in granting a restraining order two months ago, pending arguments on September 21.

Failure of the public service commission to make a physical valuation of the Wisconsin Telephone Co.'s property as a basis for its emergency rate order was a factor in the action of Judges Geiger, George T. Page and Louis FitzHenry.

Attorney Alvin C. Reis, special counsel of the commission, conceded that no physical valuation was made as the basis of the order, but it will require a full year to complete the valuation now under way and that is why the order was made temporary and for one year, he said; but regardless of whether or not the commission erred in its method, he contended, the burden was upon the company to prove that the rate as ordered was confiscatory.

"They do not do so," he claimed, "by merely showing that the commission did not make a valuation."

Mr. Reis pointed out that the Wisconsin statutes empower the commission to make temporary rate orders and that it made some emergency rate increases after the world war without a valuation.

Judge Page demanded to see the Wisconsin statute.

"Do I understand," he asked, "that the commission can walk into a utility, hang up its hat and say, 'Mr. Utility, your rate is reduced 20 per cent,' and then put on its hat and walk out?"

Pointing out that the public can be protected by a bond or by impounding revenues of a company pending final determination, Judge Page also inquired how the company would be compensated for its loss of some $1,800,000 if the commission, after a year's study, found that its emergency order was wrong.

Attorney Reis admitted that the company would not get its money back, but he contended that the rate as fixed by the commission was not confiscatory and that many private companies would welcome the 6.4 per cent return on capital stock allowed by the commission in fixing the temporary rate. He declared the commission had proceeded upon sufficient information to justify its conclusion that the company's book values were incorrect.

Maintaining that the commission weakened its case by conceding it had no valuation basis for its order, however, Judge Page held that "the people are entitled to a fair rate and should have it, but that is no reason for causing an irreparable injury to the utility."

The commission's order reducing the exchange rates of the company by 12½ per cent entirely ignored the resulting effect upon the company's toll system, Edwin S. Mack, Milwaukee, counsel for the company, charged. He reiterated contentions of the company that the order would actually reduce its net earnings by 40 to 50

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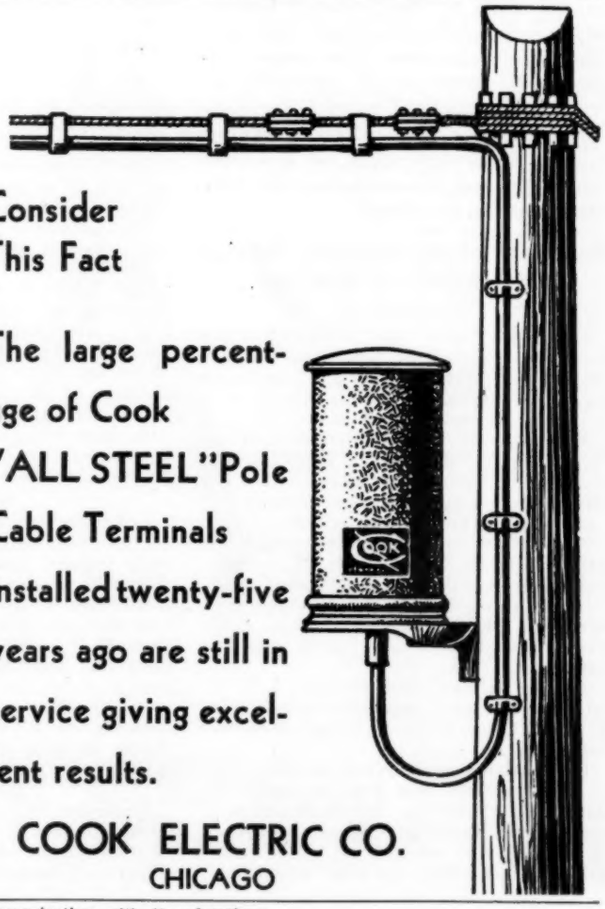

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per cent and cause a loss of $1,800,000 in revenues.

He challenged the commission's allocation of 9½ per cent as the total amount of the company's property used in terminal toll service, whereas, he claimed, one-third of the property is engaged in toll service.

He was questioned closely by Judge Page on his contention that under its theory of allocation the commission's rate reduction order would allow the company only a confiscatory return for its terminal toll service, which was described as the service between the subscriber and the local switchboard separate from the service between exchanges.

He relied, Mr. Mack explained, on a supreme court decision holding that any one part of a service may not be made unremunerative.

He declared that the affidavits of financial experts support the company's position that 8 per cent is a reasonable return under present conditions and contended that the commission was unjustified in fixing a 6 per cent return on common stock allowable to local service as a rate basis. The commission, he pointed out, made no attempt to place a valuation upon the property devoted strictly to local service.

He maintained that the company's 96 exchanges in the state can not be treated as a single unit for rate-making purposes unless the toll system is taken into consideration.

Moreover, Mr. Mack declared, the commission made no discrimination between intrastate and interstate service in its order allocating 9½ per cent of the property to terminal exchange service. About 80 per cent of the entire toll service is intrastate. The commission also had no jurisdiction to order a reduction under the Wisconsin statutes because no emergency has been shown to exist, he claimed.

Summary of Commission Rulings and Schedule of Hearings.

California

September 14: The Public Utilities California Corp. filed application for authority to furnish farmer line service at its Burney exchange, Shasta county.

District of Columbia

September 17: Order issued directing the Chesapeake & Potomac Telephone Co. to credit its depreciation reserve with 5 per cent interest a year computed monthly.

Illinois

August 24: Schedules presented on which no action was taken by the commission: Western Illinois Telephone Co.'s I. C. C. 1, sheets 1 to 9, service connection, move and change charges in Aledo, Little York, New Boston and Seaton, effective September 5, 1932.

Illinois Valley Telephone Co.'s I. C. C. 1st revised sheet 6, applicable to toll service from Camp Point to Paloma, effective September 17.

Illinois Commercial Telephone Co.'s I. C. C. No. 1 revised sheets 1 and 4, LeRoy exchange; I. C. C. No. 1, revised sheets 1 and 4 Downs exchange, effective September 12, changes the method of billing from quarterly to monthly for rural subscribers.

August 30: Special permission granted application of the Deer Creek Telephone Co. to place in effect on September 1, 1932, rates and rules for telephone service in Deer Creek and vicinity, stated in rate schedule I. C. C. No. 2, 1st revised sheet No. 1.

August 30: Special permission granted application of the Good Hope Farmers Switchboard Co. to place into effect on September 1, reduced rates for telephone service at the Good Hope exchange.

September 8: Schedules presented on which no action was taken: Illinois Commercial Telephone Co.'s I. C. C. 1, revised sheet 1, applicable to toll service at Piper City exchange, effective October 1.

Illinois Commercial Telephone Co.'s I. C. C 5, revised sheet 1, applicable to New Holland exchange, billing of rural subscribers changed from quarterly to monthly, effective September 27.

Woodhull Union Switchboard Association's I. C. C. 2, applicable to Woodhull exchange, refiling of all rates and addition of a collection rule for switching service dues, effective September 30.

Illinois Bell Telephone Co.'s advice No. 310, service-observing equipment rates, effective October 1.

September 14: Order approved granting application of the Illinois Commercial Telephone Co. to suspend service connection charges at all of its exchanges throughout the state, effective October 1, and continuing throughout the month only.

Kansas

September 29: Hearing in Preston, Pratt county, on complaint of the Interstate Public Utilities Corp. vs. the Preston Mutual Telephone Co.

October 25: Hearing in Fredonia, Wilson county, on application of The Kansas Telephone Co. for permission to discontinue its exchange service at New Albany and connect the subscribers of that exchange to its Fredonia exchange.

Minnesota

September 21: Order issued approving application of the Grey Cloud Telephone Co., a Minnesota corporation, as purchaser, and the Grey Cloud Telephone Co., a mutual cooperative (de facto) corporation and all of its stockholders as sellers, for the approval by the commission of the purchase and sale of all of the property of the last named de facto corporation.

October 11: Hearing in Caledonia on application of F. A. Groezinger, mayor of the village of Caledonia, requesting reduction in rates charged by the Tri-State Telephone & Telegraph Co. in Caledonia.

October 21: Hearing in Motley on application of the Cass County Mutual Telephone Co. for permission to run a toll wire from its switch at Leader, into Motley; also to extend a party line into Motley so subscribers may call Motley direct.

Missouri

September 16: The Winfield Telephone Co. of Winfield, Lincoln county, voluntarily reduced its rates with permission of the public service commission.

Effective October 1, the charge for business stations, direct line, will be reduced from $2.25 to $2; business stations, two-party line, from $2 to $1.75, and residence stations, direct line, from $1.50 to $1.25.

On all other rates, the company offers a reduction of 10 cents a month where the charge amounts to 50 cents or more a month.

New York

September 16: The Margaretville Telephone Co. filed a new schedule of telephone rates to become effective October 1, in the villages of Margaretville and Andes, Delaware county. The new rates are slightly higher than those now in effect, but are considerably lower than rates which the company proposed recently to put in effect. The schedule of proposed higher rates was withdrawn by the company after the commission ordered an investigation of the rates.

The new rates are the same as those of the New York Telephone Co. except that the four-party residence rate is 25 cents per month more than the New York company.

A decrease in the individual business service in Margaretville, which is now $4 per month, will affect 27 subscribers and reduce the revenue of the company $162 per year. Individual business service in Andes is increased $1.25 per month and individual residence service 25 cents per month. Rural business service in Andes is increased $1 per month and multi-party residence service in Andes 50 cents per month. These changes will mean an increase of $192 a year in the company's revenue, which leaves a net revenue increase of $30 a year.

September 30: Hearing on complaint of city affairs committee of the city of New York against charges made by the New York Telephone Co. for hand-sets.

Oklahoma

October 25: General hearing on investigation of rates of the Southwestern Bell Telephone Co.

Tennessee

September 12: The Southern Bell Telephone & Telegraph Co. filed an answer to a petition before the commission asking that rates of the company be reduced. The petition asking a reduction was recently filed by Fred M. Williams, Chattanooga lawyer. He charged the company earned as high as 13 per cent on its investment. The company, in its answer, declared it is earning less than 6 per cent on Tennessee properties.

Wisconsin

September 24: Approval granted applications of the following five telephone companies for permission to reduce rates: The New Cashton Telephone Co.; the Bangor Telephone Co., of Bangor; the Marquette & Adams Telephone Co., of Oxford; the Vandyne Telephone Co., of Vandyne; and the Westby Telephone Co., of Westby. The reductions were reported to affect 1,400 subscribers and amount to $3,200.

September 26: Hearing in Madison on methods of administration of the new law which provides for the assessment of the cost of public utility hearings against the utilities. Objection filed by Wisconsin Telephone Co. Hearing continued.

September 27: Hearing in Madison on the rules and regulations of the public utilities in regard to deposits of subscribers for service and disconnect charges.

September 28: Hearing on petition of citizens of Mt. Vernon asking for lower telephone rates charged by the Mt. Vernon Telephone Co.

September 28: Hearing in Madison on the requests of the Milwaukee hotels for a still higher allowance for room telephone service.

September 29: Hearing in Madison on a dispute between rival public utilities over a division of territory. The claimant companies are located in Iowa county. The territorial divisions in dispute are for telephone service.

The companies involved are Dodgeville Northern Telephone Co., the Spring Green & Wyoming Telephone Co., the North Standard Telephone Co. and the Dodgeville & Union Mills Telephone Co.

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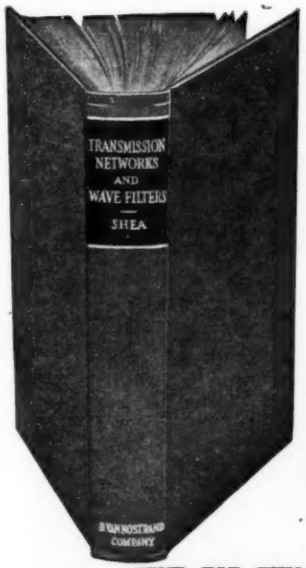
T. E. SHEA, B. S., M. S.
Member of the Technical Staff, Bell Telephone Laboratories



The calculation and design of telephone networks and wave filters are fully presented in this book, written by Mr. T. E. Shea of Bell Telephone Laboratories. It embodies the most recent developments in this field as well as the standard practice.

"The Telephone Equipment of 1929," "The New Science Telephony," "Transmission Networks and Wave Filters" and "Radio Broadcasting Engineering" are a few of the subjects capably discussed in this valuable book.

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Cut-Over to Kellogg Equipment in Badin, N. C.

By A. B. Pogue,
District Manager, Kellogg Switchboard & Supply Co.

About two years ago, the Tallassee Power Co., a subsidiary of the Aluminum Co. of America, builders and operators of the large hydro-electric projects on the Yadkin River adjacent to the little town of Badin, N. C., and the Albemarle Telephone Co. of Albemarle, N. C., which operated a magneto telephone plant of about 60 telephones in Badin, reached an agreement regarding telephone service in Badin.

The Tallassee Power Co. agreed to turn over its magneto telephone plant of 140 telephones to the Albemarle Telephone Co., which, in turn, was to build an up-to-date telephone plant of the common battery type to replace the old magneto plants.

Some time after this agreement was consummated, the Albemarle Telephone Co., through its treasurer and general manager, H. L. Horton, placed with the Kellogg Switchboard & Supply Co. an order for a two-position common battery switchboard and other central office apparatus of the latest design. In fact, all the material for the construction of a complete outside cable plant and subscribers' station equipment was ordered from the Kellogg company.

The removal of the two old magneto plants, the outside of which consisted mostly of open wire, added considerably to the appearance of this attractive little town. The new cable plant was routed principally in alleys and back streets, thus doing away with the unsightly appearance of the heavy open wire leads on the main streets.

As soon as the new service was available and the people of Badin fully began to realize the advantages of the common battery system, orders for new telephone installations were received daily. Several months after the new system was cut-over, there were about 25 per cent more telephone users in Badin than there were on the two old magneto systems combined, a very good increase considering the fact that the saturation was already above the average for a town of this size.

Airplane View of Badin, N. C., Showing Works of Carolina Aluminum Co., Which Largely Owns the Town, in the Upper Left.

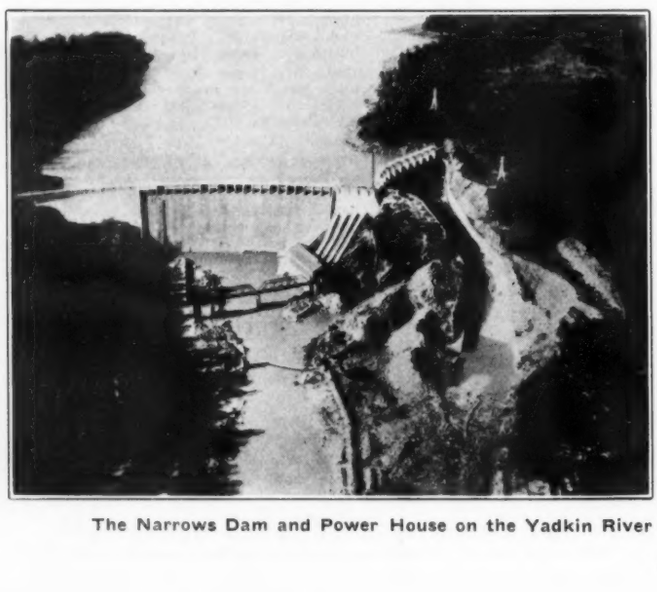
Badin is a very young town of the strictly industrial type. It is owned largely by the Carolina Aluminum Co. (name changed from Tallassee Power Co., 1931) and used for the housing needs and social advantages of its officials and employes. Quite an interesting bit of history has been made here since some 25 years ago, when a man dreamed of harnessing the yellow floods of the Yadkin River and using the great electrical energy thus made available for the manufacture of aluminum.

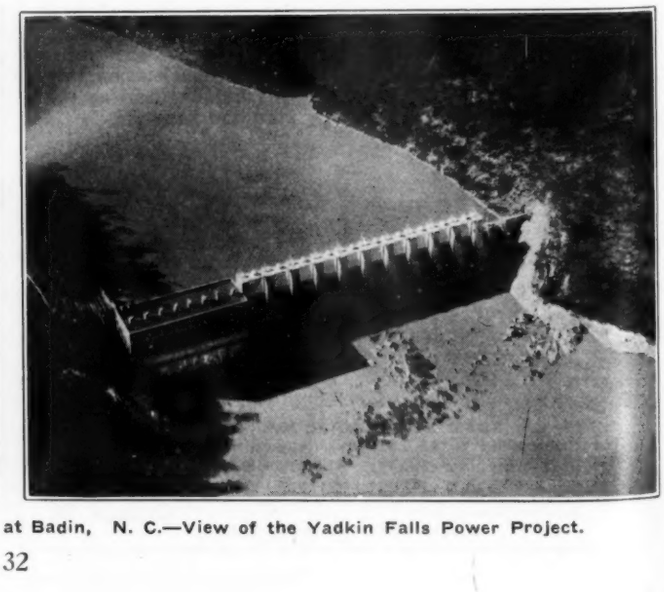
The holdings of the Southern Aluminum Co. were purchased by the Tallassee Power Co. early in 1915. The Tallassee company immediately set about completing the dam at the Narrows, at that time the largest spillway dam in the world, forming a lake so vast that it took the mighty Yadkin 30 days to fill it.

The Aluminum plant, started in 1914 by Frenchmen who returned to France when the war broke out, was completed, having been rearranged and enlarged to meet the demands of the new owners. Dwellings, schools, churches, theaters and business houses were added to the village built by the French. Thus the bustling little industrial town, which is the Badin of today, came into being. In 1927, a third power project was completed on the Yadkin, 37 miles above the Narrows. Telephone service between the camps of the men carrying on this vast undertaking and the outside world was maintained from the very start.

In 1907 the Whitney company installed a magneto switchboard at the site of the Whitney dam, now known as Old Whitney. The Southern Aluminum Co. moved this magneto switchboard to Badin in 1912, installing it in the excellent new office building they had erected there. This same switchboard gave service to the subscribers of the Tennessee company in Badin until it was abandoned in November, 1929.

The Albemarle Telephone Co. built a pole line and strung one copper circuit to Badin in 1912, connecting with the power company's switchboard. Then, in 1915, on





The Narrows Dam and Power House on the Yadkin River at Badin, N. C.—View of the Yadkin Falls Power Project.

a permit granted by the Tallassee Power Co., a magneto exchange was built in Badin by the Albemarle Telephone Co. and an additional circuit was strung from Albemarle to Badin and connected with the telephone company's switchboard.

Trunk circuits were established between the telephone company's switchboard and the power company's switchboard, thus giving the subscribers of either system connection with those of the other and toll connections through Albermarle and over the Albemarle Telephone Co.'s toll lines to the Bell exchange at Salisbury.

The living and working conditions of the citizens of Badin are zealously guarded by their employer, the Carolina Aluminum Co., and no effort is spared by the officials in securing the facilities that keep these conditions ideal. So the up-to-date common battery telephone service now being rendered by the Albemarle Telephone Co. in Badin, hits a responsive cord in both the citizens and officials, who express their complete satisfaction with this improvement so vital to the progress of their town.

Obituary.

WILLIAM ANDERSON, for five years assistant treasurer of the Western Electric Co. at 195 Broadway, New York, died on September 12 at his home in East Orange, N. J.

Mr. Anderson was 56 years old. He was born in Yorkshire, England, and educated in the public and private schools in that country. He had been connected with the Bell telephone system for 37 years, having started as a stenographic and confidential clerk with the American Bell Telephone Co. in Boston in 1895.

In 1910 he became secretary to Charles G. DuBois, who was then comptroller of the American Telephone & Telegraph Co. in New York. When Mr. DuBois became president of the Western Electric Co. in 1919, Mr. Anderson continued as his secretary.

Mr. Anderson was a 32nd degree Mason and past commander of Jersey Commandery No. 19, Knights Templar, in East Orange. He was a member of the Telephone Pioneers of America and of the New York Credit Men's Association.

Automatic Electric Co. Introduces a New Compact Ringer Box.

A new, compact ringer box has recently been placed on the market by the Automatic Electric Co., Chicago, Ill. This new ringer box, designated as type 32, is much smaller than the conventional types formerly used, being only 7¼ inches high, 5½ inches wide and 2⅝ inches deep.

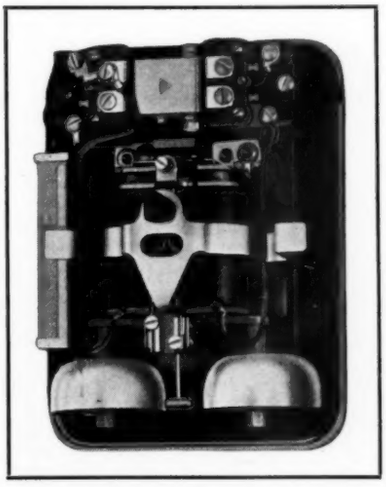
It occupies approximately 40 per cent less mounting space, it is stated, and is considerably smaller in depth as well. This small size facilitates mounting in places where space is too limited to accommodate the ringer box of conventional size. In addition, it is less conspicuous and less obtrusive, regardless of where it is mounted.

The compact design of the type 32 ringer box is made possible by the perfection of a new induction coil and condenser, much smaller in size than any formerly available. Many other innovations in design have been introduced by Strowger engineers in the construction of the box, making possible the reduction in size without, it is said, in any way limiting the customary operating characteristics found in types now in general use.

The base and cover are made of moulded Bakelite. This modern material is highly dielectric and is completely immune to corrosion and to the ravages of insects, an item of particular interest to telephone executives whose companies operate in tropical or semi-tropical localities. This material has a black, lustrous finish which requires no refinishing at any time, but retains its rich, highly polished surface throughout a lifetime of use.

Another interesting feature of the type 32 ringer box is that provision is made for the mounting of a signal buzzer inside the box, if desired, in addition to the usual bell signal. This buzzer is very often desirable for use as a secretarial signal, to indicate on an extension telephone who is wanted.

Another unusual feature is the ringer cut-off key, which may be furnished if desired. (If not desired, a plain cover is provided for the box.) This key can be connected either to permit cutting off the ringer, with which it is mounted, or to permit cutting off the ringer of an extension telephone. These features are designed especially for use in conjunction with extension telephones, which are coming into greater use in homes as well as offices, schools, factories, etc.



Interior View of Type 32 Ringer Box Showing Its Compact and Efficient Arrangement.

A summary of the special features and advantages claimed follows:

1. Despite its small size, there is ample space for both talking or ringing condensers, as required.
2. Either straight-line or harmonic ringers can be furnished.
3. A ringer cut-off key, furnished if desired, to control either the ringer with which it is mounted or the ringer of an extension telephone.
4. The heads of the induction coil serve as terminal blocks, thus eliminating separate terminal strips.
5. The line terminals are on the rear of the box; there are no holes in the case except the sound slots at the bottom. These are covered with a fine mesh brass screen to prevent the entrance of insects.
6. If desired, a buzzer useful for a secretarial signal, for extension telephones, etc., can be provided within the box.

New Type 32 Ringer Box of Automatic Electric Co.

The new type 32 ringer box is now being produced and is available for prompt delivery. Prices and further information will be furnished by writing Automatic Electric Co., 1033 West Van Buren street, Chicago.

Former Stromberg-Carlson Installer's Worthless Checks.

W. M. Angle, vice-president of Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., has issued a warning to various telephone companies concerning bad check operations of Willam R. Sauerteig, a former employe of Stromberg-Carlson. During 1923 and 1924 he worked as an installer for the company and has recently been inducing telephone company employes with whom he became acquainted while in Stromberg-Carlson's employ, to cash checks that have proved to be worthless.

Sauerteig's method has been to represent himself as in Stromberg-Carlson's employ, but on vacation—he was traveling in a car with a New York license—and in temporary need of funds. He has operated in Missouri, Iowa and Wyoming.

Warrants are out for Sauerteig's arrest and if he can be apprehended and turned over to local police, they can secure full details with respect to his record by communicating with Andrew J. Kavanaugh, chief of police, Rochester, N. Y.

Instructions for Using the Universal Test Unit.

1. To use as voltmeter, set current key on open position, set voltage key to either *AC* or *DC* and connect the source to be measured to either the *AC* or *DC* voltage terminals. The desired range is selected by means of the voltage selector.

2. To use a milliammeter, set current key on either *AC* or *DC* and connect current terminals in series with circuit to be measured. Set current selector on desired *AC* or *DC* range.

3. To use as an ohmmeter for measuring low resistance, set ohmmeter selector on *LR*, voltage key to *DC*, current key to *DC*, and current scale selector to 25 *DC*. Connect resistance to be measured to *DC* voltage terminals. To use as ohmmeter for measuring high resistances, set ohmmeter selector on MR, voltage key on *DC*, current key on 1.0 ohmmeter and connect resistance to be measured to *DC* voltage terminals.

4. To test telephone dry cells, set voltage key on *DC*, current key on open, and voltage selector on 5.0. Operate dry-cell test key and note voltage when dry cell is connected to the *DC* voltage terminals. Reject cells showing less than 0.93 volt.

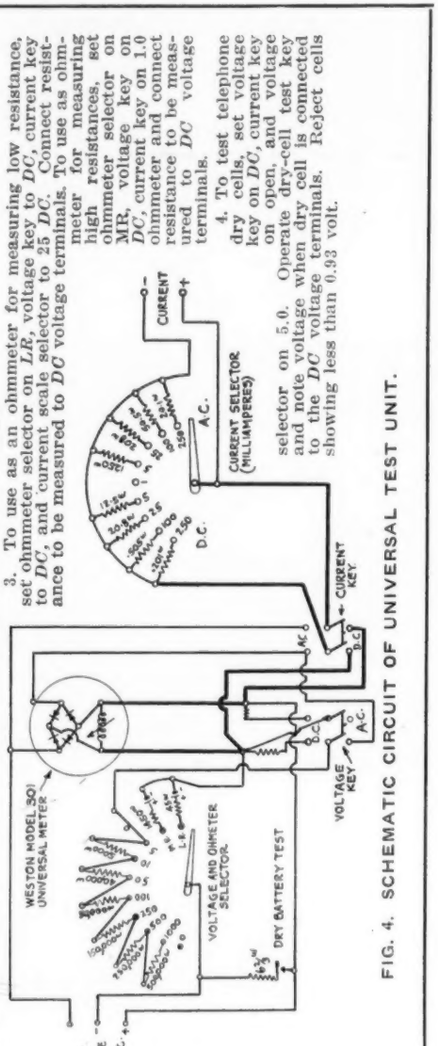


FIG. 4. SCHEMATIC CIRCUIT OF UNIVERSAL TEST UNIT.

The ranges available in the circuit shown are as follows:

Alternating Current and Direct Current	
Voltage Range (Volts)	Current Range (Milliamperes)
5, 10, 50, 250, 500, 1,000	1, 5, 25, 100, 250

All voltage scales have a minimum impedance of 1,000 ohms per volt (full scale deflection). The resistance of the current scales (full scale) is as follows:

Range (Milliamperes)	Alternating Current, Scale, Ohms	Direct Current, Scale, Ohms
5	1,000	10.0
25	199	1.99
100	50	0.50
250	20	0.20

The schematic circuit of the universal test unit is shown in Fig. 4. It will be noted that the voltmeter scales are obtained by inserting additional resistance in series with the meter; and the ammeter scale by placing resistance in shunt across the meter.

The meter has two sets of terminals, one set for alternating current and one set for direct current. The internal resistance of the alternating current portion of the meter is approximately 5,000 ohms. Inasmuch as the current required for full-scale deflection is one milliampere, the minimum voltage range is five volts.

In order to compensate for the fact that the meter is calibrated in "effective values," whereas the alternating current (rectifier) portion of the meter responds to average values, it is necessary to provide a shunt across the direct current portion of the meter which when open permits a current of 0.896 milliampere (average value) to give full-scale deflection. A current of 0.896 milliampere (average value) is equivalent to a current of 1.00 milliampere effective value. Therefore, when reading alternating current, the shunt is open, and when reading direct current it is closed. This shunt is mounted on the back of the meter and is furnished as a part of the meter.

The shunt is automatically thrown in and out of circuit by means of the *AC-DC* switch shown in Fig. 4. Two keys are provided, one for voltage readings and one for current. The proper key should be thrown to either the alternating current or the direct current side and the range selector set on the desired range when making a measurement.

Resistance measurements and continuity tests are made by utilizing the 1 and the 25 milliampere scales in series with a 1½-volt flashlight cell. Two resistor ranges are provided, one suitable for measuring low resistances and one for high resistances. When using the low resistance scale, the current selector dial should be set on 25 milliamperes direct current, and for high resistance on the one milliampere range.

Constructional Details.

The universal test unit will be most useful if built in a small, compact, yet rugged cabinet so that it may be carried around and used on outside as well as central office trouble.

It is highly important that accurate resistance units of the wire-wound type having a low resistance temperature coefficient be employed.

The shunt resistances can be purchased (on a special order) from manufacturers, or the wire purchased and made up with desired shunts, using a Wheatstone bridge or preferably adjusting to the correct values by calibrating by comparison with another meter known to be accurate.

A complete list of parts follows:

Quantity	Parts Required
1	Weston model 301, universal AC-DC meter.
5	Binding posts (Weston).
2	Double-pole, double-throw keys.
1	Single-pole key.
1	Bakelite panel and cabinet.
2	Flashlight cells.
2	General Radio type No. 202 switches.
20	General Radio type No. 138-B switch contacts.
1	Wire-wound resistor, 4,950 ohms.
1	Wire-wound resistor, 5,000 ohms.
1	Wire-wound resistor, 40,000 ohms.
1	Wire-wound resistor, 200,000 ohms.
1	Wire-wound resistor, 250,000 ohms.
1	Wire-wound resistor, 500,000 ohms.
Resistance wire (manganin) for winding shunts.	

The wiring shown in heavy black, Fig. 4, should consist of No. 14 copper wire or larger. All other wiring may consist of No. 18 to No. 22 insulated copper wire. Braided No. 22 switchboard wire makes a nice appearing job.

Uses of the Universal Test Unit.

The universal test unit has a multiplicity of uses, some of which are discussed in the following:

Transmission Testing: Transmission tests are made by applying a 1,000 cycle tone to the input of a line or equipment to be measured and measuring the voltage at the input and output ends of the line or equipment. The loss in decibels is then found by taking the ratio of input to output voltage and referring this value to a table of voltage ratios vs. decibels (see table in the engineering data sheets, Telephony of May 23, 1931).

For example, if the input voltage were 3 volts and the output voltage 1½ volts, the voltage ratio would be $\frac{1.5}{3.0} =$ 0.5. Referring this value to the table, we find that a voltage ratio of 0.5 corresponds to a loss of 6.0 db.

Personal Notes from the Field

Dr. Thomas A. Watson, builder of the world's first electric telephone as assistant to its inventor, Dr. Alexander Graham Bell, celebrated his 60th wedding anniversary with his family at Bridgewater, N. H., the early part of last month.

Randolph Eide, president of the Ohio Bell Telephone Co., has been appointed chairman of the Fourth Federal Reserve District's committee on rehabilitation. In commenting on the appointment, the Cleveland Plaindealer said:

"No better advocate of such a campaign could be found than Randolph Eide, who is carrying the gospel of creative spending throughout the Fourth Federal Reserve District. As chairman of the district committee on industrial rehabilitation, he is putting the same energy and resourcefulness into this effort that he has shown in many other public services."

R. B. Still, who for the past two years has been associated with the Telephone Bond & Share Co. in Kansas City, Mo., now has his headquarters in Portsmouth, Ohio, where he is active in the operation of the company's properties in the eastern and southern territory.

S. B. Green, acting general superintendent of the Southern Continental Telephone Co., with headquarters at Cookeville, Tenn., for the past ten months, has been transferred to the Georgia Continental Telephone Co. He is located at Dawson, Ga., as district manager of the company's properties in southwest Georgia.

Prior to going with the Southern Continental company a couple of years ago, Mr. Green was general superintendent of the Oklahoma Telephone Co. He had previously spent about 20 years in Iowa with both Independent and Bell companies.

B. Y. Chambers, manager of the Madison, Ind., exchange of the Southern Indiana Telephone & Telegraph Co., of Seymour, Ind., for the past four years, has been transferred to Greensburg, Ind., as manager of the Decatur County Independent Telephone Co.

J. W. Hostedt, of Huntingburg, Ind., has been placed in charge of the Madison, Ind., exchange of the Southern Indiana Telephone & Telegraph Co., of Seymour, Ind.

Charles Dalrymple, formerly local manager for the United Telephone Co. at Blue Rapids, Kans., is now manager at Washington, Kans., where he has charge of the United exchange there and also the one at Hollenberg. The transfer is in the form of a promotion for Mr. Dalrymple, who was with the United company in Blue Rapids for more than seven years, serving as manager since January, 1928.

V. W. Robinson, of Winchester, Ind., has been appointed general manager of the Eastern Indiana Telephone Co. to fill the vacancy caused by the death of John I. Cheney.

Mr. Robinson has been connected with telephone work for the past 20 years and before his promotion was superintendent of the various company exchanges in the county.

A. H. LaBarre, Montreal, Que., supervisor of toll lines, Bell Telephone Co. of Canada, entered the communication field with the Western Union Telegraph Co. at Buffalo, N. Y., as a telegraph operator on July 1, 1892, two score years ago. Congratulatory tributes in recognition of "Bert" LaBarre's completion of 40 years of faithful and effective service were extended to him recently by his fellow workers in the Bell Telephone Co. of Canada at Montreal.

H. G. Young, general plant manager of the eastern area of the Bell Telephone Co. of Canada, who officiated, recalled that in 1904 Mr. LaBarre transferred to the American Telephone & Telegraph Co. and was brought to the Bell company of Canada six years later in 1910. Because his home was in Canada, and since the Bell company there needed a first-class telegraph man, it was a happy change. In 1914 "Bert" LaBarre became supervisor of toll lines.

A silver serving tray, suitably engraved, was presented to Mr. LaBarre, and a bouquet of 40 roses to Mrs. LaBarre. Mr. Young read an illuminated letter of congratulations from the western area, and presented a fishing rod and tackle box on their behalf.

President C. F. Sise, in congratulating Mr. LaBarre, shouldered the blame for bringing him back to Canada, and ventured the suggestion that the Western Union, in 1892, must have been "cradle-snatching." Vice-President Paul A. McFarlane added his tribute in appropriate witticisms.

In the new long distance center, a little later, Mr. LaBarre was handed a silver cigarette case and box on behalf of the eastern area toll workers. Morse operators at Ottawa, Quebec, Three Rivers and Kingston tapped out congratulations to Mr. LaBarre on their respective keys.

Earle W. Lyman, Montreal, Quebec, publicity assistant and editor of "Telephone News" of the Bell Telephone Co. of Canada, was unanimously elected to the international vice-presidency of the International Association of Y's Men's Clubs, at their 11th annual convention recently held in Detroit, Mich.

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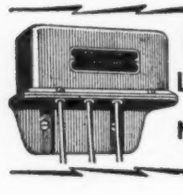
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Y's Men's clubs, an association and community service organization comprising members of the Young Men's Christian Association and incorporated under the laws of Massachusetts, are now operating in the United States (including Hawaii, the Philippines and West Indies), Canada, Australia, Mexico, China, Japan, Poland, Hungary, Esthonia, Czechoslovakia, England and Ceylon. Many telephone men hold prominent positions in their local clubs throughout these 12 different countries, and several of them were in Detroit.

C. L. Kelly, general manager of the Farmers Telephone Co. of Dodge county, residing at North Bend, Neb., suffered the loss of his wife recently, after she had been long ill. Mr. Kelly was for a number of years president of the Nebraska Telephone Association, and his wife was a faithful attendant with him at its sessions for years.

R. A. Phillips has been elected executive vice-president of the Central West Public Service Co., according to a recent announcement by President Frank Milholland. Mr. Phillips has been assistant to the president for three or four years. He is succeeded in that position by R. B. Goodrich, who has been disbursement accountant. He will continue headquarters in Omaha, Neb., from which the company operates telephone, gas and electric light properties in ten states.

Herbert F. McCulla, assistant commercial superintendent for the Lincoln Telephone & Telegraph Co., Lincoln, Neb., will be chairman of the Lincoln community chest campaign committee, and will have with him as an aid C. W. Motter, public relations director for the telephone company. J. H. Agee, general manager, has been named as one of the colonels in charge of regiments of canvassers, and other executives of the company will have other posts. These men are drafted each year for community chest campaign work, and have found this an effective public relations assignment.

Lewis B. McFarlane, Montreal, Quebec, former president of the Bell Telephone Co. of Canada, who retired from active administration of the company's affairs when he relinquished the chairmanship of the board of directors in 1930, celebrated his 81st birthday on September 8. Messages of hearty congratulation and best wishes for many happy returns of the day were received from far and near.

Still hale and hearty and very much alert to current happenings, particularly as they pertain to the telephone business, Mr. McFarlane has presented to the readers of "The Blue Bell," the Bell of Canada employes' magazine, the following birthday message of hope and encouragement, that appears in the October issue:

"After the bitter experience of the past three years, business is now slowly moving with greater confidence. The dawn of a brighter day has appeared on the horizon and hope is returning that the world has emerged from gloomy shadows. There is now no fear of collapse; on the contrary, a promise of better days is in the offing."

Obituary.

Frank D. Stalnaker, director of the Indiana Bell Telephone Co. and for 20 years president of the largest bank in Indiana, died recently at his home in Indianapolis after an illness of a month.

N. E. Kaylor, general employment supervisor for the Indiana Bell Telephone Co., died at his home in Indianapolis on September 9.

Mr. Kaylor had been in the service of the company since 1915 occupying positions in South Bend as plant chief, manager at Bedford and district plant chief at Bloomington. He was a member of the Bell Telephone Post No. 16, American Legion. He is survived by the widow, his mother and one daughter.

Lawrence Henry Choquette, east district manager of the Bell Telephone Co. of Canada at Montreal, Quebec, died suddenly on the morning of Wednesday, September 14, following an attack of heart failure.

Although only in his 42nd year, Mr. Choquette had completed more than a quarter century of effective service with the Bell of Canada since entering the company's employ as a clerk at Three Rivers, Quebec, on February 1, 1907. He was probably one of the best known telephone men in Quebec Province and his popularity extended into Ontario, particularly eastern Ontario where he was well and favorably known in such important centers as Cornwall, Pembroke, Brockville and Smiths Falls where he had acted in the capacity of relieving manager as far back as 1911.

His first managership for the company was at Grand Mere, Quebec, in 1910 and 1911. From 1912 to 1923, Mr. Choquette was manager at St. Johns, Quebec. In the two years following, he was commercial supervisor in Quebec City and late in 1924 he went to St. Lambert as district manager. Remaining there only a few months, he was transferred to Montreal as assistant manager. In 1928 he assumed the managership of Montreal's large east district.

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